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Supply and Demand Balance in the B.C. Food Sector : A Statistical Analysis

ARDSA Project No. 271304

Under

Canada, British Columbia Subsidiary Agreement

On Agriculture and Rural Development

Roe S. Markham

DeltaTech Research
Economic Research Consulting

DECEMBER 1982

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INTRODUCTION

Background

During the last decade, substantial pressures on British Columbia's agricultural industry to increase output have been produced through population and income growth. British Columbia's population grew at an average rate of 2.3 per cent in the period 1971-81, more rapidly than that of any of the other provinces except Alberta. A substantial part of this growth occurred through net in-migration. As a result, the proportion of people within the province in the age group 15 years and over, who can be described as "full consumer units", increased from 72 per cent to 77 per cent. In the same period, personal real disposable incomes in the province rose significantly at an annual rate of 3.4 per cent.

The increases in population produced an increased demand for food, as evidenced by the significant expansion in the volume and range of food sales within the province. During the decade food and beverage sales grew by 19 per cent in real terms, or at an annual real rate of nearly 2 per cent. In 1981, the total retail value of food and beverage sales exceeded $3 billion in B.C. At the same time, during the decade, the changes in consumers' real disposable incomes produced relative shifts in demand among various food groups.

Purpose of Study

Given this significant expansion of food demand, both overall and within sectors, and the major incentives it created, how did the local agricultural and food industry perform in

meeting the demand? The present study is an attempt to answer this question. It reviews past and present provincial food production in relation to consumption, and develops measures of the share of food supplied by the provincial industry over a period of years, across and within sectors. These measures of the share of food supplied provincially through time are of practical value, not merely for determining changes in the extent of British Columbia's dependence on out of province supplies and the resultant sensitivity to fluctuations caused by weather, disease, etc. in the rest of Canada and other countries, but also for identifying opportunities for import replacement and for determining the resource cost to the provincial economy of expanding agricultural output.

The study attempts to improve on two previous studies performed within the Ministry, namely the Pearson Paper (1976) and the O'Brien Study (1979). The Pearson report developed an aggregate value ratio in which the retail equivalent value of farm cash receipts, minus exports, was expressed as a percentage of the value of retail food sales. The retail-equivalent value of farm cash receipts served as a proxy for production for domestic use and was derived by adjusting farm cash receipts by a factor reflecting the average proportion of retail prices received by farmers (estimated at 41 per cent in 1974). On the basis of this approach, it was determined that British Columbia supplied 43 per cent of the food it consumes. The O'Brien Study undertook a detailed comparison of production and consumption levels, by weight. Consumption was derived by multiplying national per capita consumption estimates by the provincial population. The comparison of physical output with consumption thus estimated, yielded an average production to consumption ratio of 42.9 per cent for 1977.

Significant weaknesses in both these studies were:

i) the failure to include exports of certain commodities, where such exports are not included directly in reported production. For example, in the beef sector, both studies inadvertently excluded exports of live cattle. The latter are a part of annual production in addition to cattle-for-slaughter which the studies had assumed to be the total output of the sector.
ii) the use of inappropriate conversion factors for estimating the consumption of dairy products, a significant item in total British Columbia consumption.

A particular weakness of the O'Brien Study, which developed an overall quantity ratio, was the aggregation of diverse food commodities simply by physical weight (expressed in raw product equivalents) rather than by a valid common physical measure such as their energy or nutritional equivalent.

The present study attempts to make corrections for these deficiencies. Additionally, it updates the commodity ratios on both a value and weight basis to 1980.

Scope

The study develops a time series of British Columbia production, imports, exports and consumption of food by major commodity group. It presents such information for the years 1961, 1971 and 1975-1980 for the following commodity sectors:

1. Red Meats
2. Poultry and Eggs
3. Dairy Products
4. Fruits
5. Vegetables
6. Fish
7. Grains
8. Miscellaneous

In addition to the foregoing sectors, two non-food sectors, linked to agricultural activity within the province viz. floriculture and alcoholic beverages, are included at the end of the study.

Quantity and value data are reported for each of these various sectors, and thereafter production is calculated as a ratio of consumption, for the individual commodity sectors. Finally, the sectoral ratios are brought together in one overall ratio on the basis of value.

Methodology and Sources

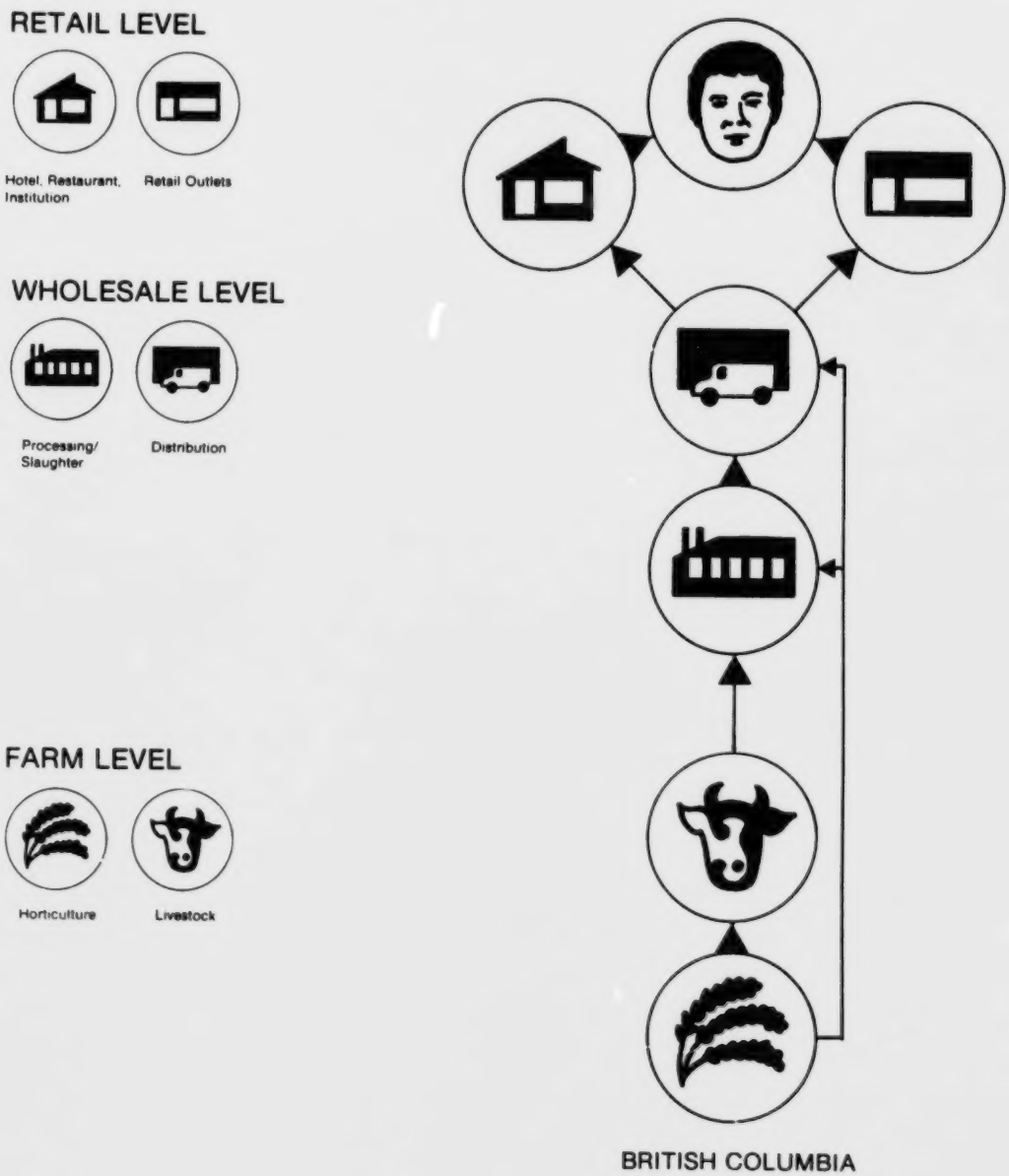
i) The Marketing Level for Valuation Purposes

Principally, the marketing of food within British Columbia occurs on three levels: retail, wholesale and farm. Figure 1 illustrates the flow of food. At the wholesale level, food is processed and distributed, or, as in the case of fresh commodities i.e. fruit and vegetables, simply distributed after transport from the farm. At the retail level, food is sold to individuals either through retail market outlets in unprepared form, or through hotels, restaurants and institutions in prepared form.

The measurement of the dollar value of production and the corresponding value of consumption could be considered at any of these three levels of marketing. Since the purpose of the study is to measure the production and consumption of food of provincial agricultural origin, measurement at the retail level would not be appropriate. The reason is simply that the retail value of food includes imports of consumer foods besides provincially produced and processed foods. Similarly, the value of food products marketed at the farm

FIGURE 1

The British Columbia Food System



level would not be an appropriate measure of production, since the value of raw products imported into the province for further processing is not taken into account in farm cash receipts. A problem also exists with the latter measure in converting imported processed goods such as cheese, tea, coffee, etc. to their raw product equivalent, when consumption is being compared with production. For these reasons, valuation was considered at the wholesale level with the aim of ensuring total industry coverage.

ii) The Valuation of Production

The values and volumes of British Columbia food production were obtained from three sources: Statistics Canada, Agriculture Canada and the British Columbia Ministry of Agriculture and Food. Some difficulties were encountered in obtaining data from these sources in respect of the wholesale values of certain dairy products and sugar. However, the British Columbia Central Statistics Bureau was able to provide aggregated values of dairy products from the Census of Manufacturers Survey. For sugar, a relatively high value commodity, wholesale price information was held confidential and could not be obtained. Procedures for developing an estimate of sugar prices are outlined in the Miscellaneous section.

Another problem that arose on the production side was the double counting which occurs in respect of grain going into animal feeds. This was overcome by making the assumption that all grains produced within British Columbia will be fed to provincial livestock. This assumption is based on the fact that whereas 80 per cent of British Columbia's feed grain is shipped annually for export from the chief producing region (Peace River), there is also annually an offsetting

inflow of grain for feed use from Alberta, both movements being dictated by the economics of transportation, rather than supply capability within British Columbia. With the use of such an assumption, the difference between production and the consumption (i.e. human use and feed use in excess of B.C.'s feed output) of grain could be taken to represent the net trade for grain. A final assumption with respect to production is that year end inventories do not change.

iii) Valuation of Consumption

Initially, an attempt was made to build up an estimate of total consumption through identifying net foreign imports and net inter-provincial trade and adding these flows to local production. However, the volume of traded goods entering consumption could not be determined. Figure 2 illustrates the problem. It shows how food systems in other provinces and other countries interact with the British Columbia system at different levels. In this simplified diagram, inter-provincial and foreign trade take place only at the farm gate level and the wholesale/distribution level. Foreign trade information at the former level is well documented by Statistics Canada, but is incomplete at the latter level. The volume of inter-provincial trade at both levels is not known at all.[1] Such data are especially important when the extensive flow of goods that occurs between British Columbia and Alberta is considered, along with the fact that many goods received through B.C. ports, including U.S. border points, are destined for Alberta and points beyond. Thus, the total volume of food that is destined to points within the province could not be

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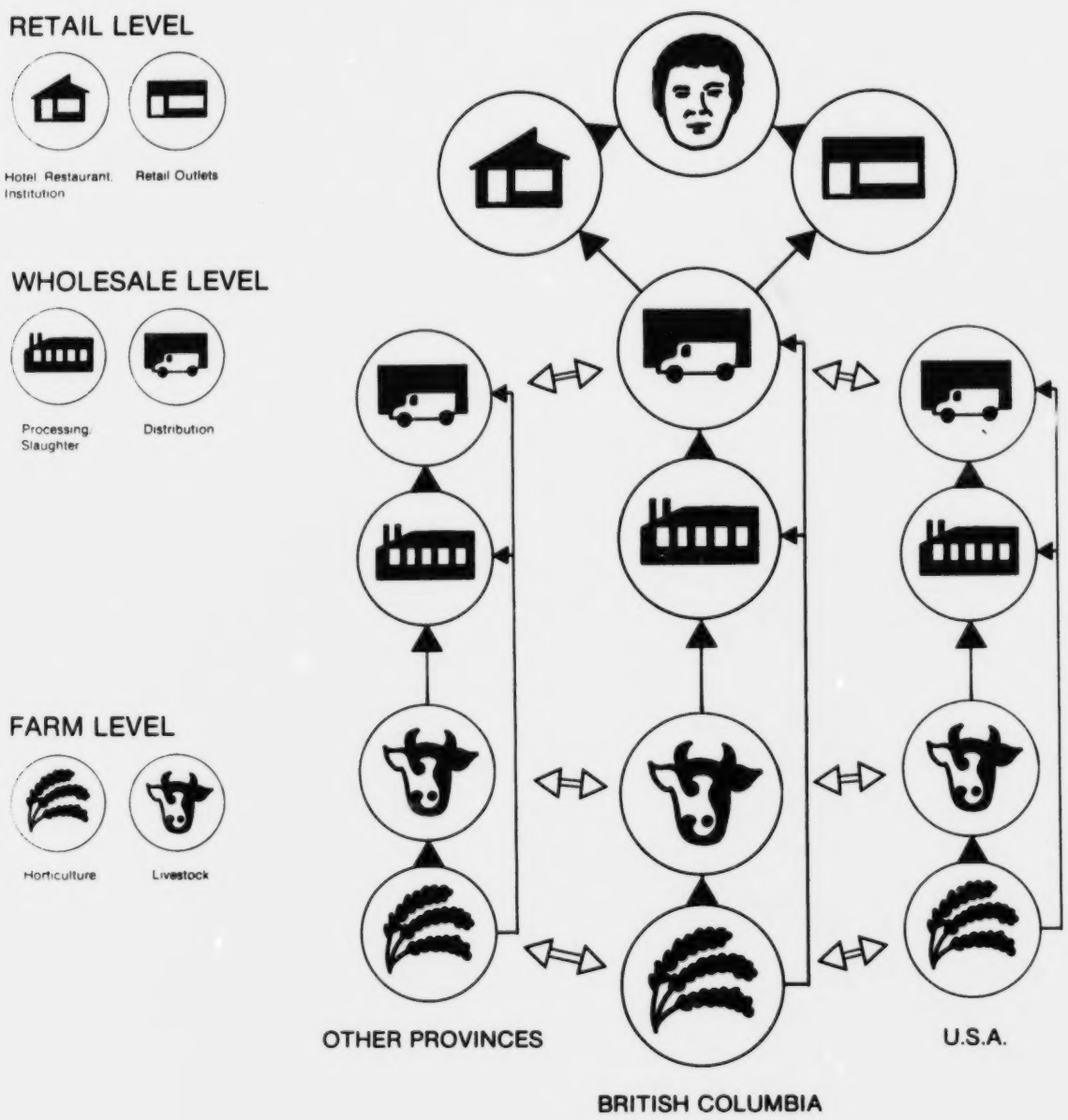
[1]Published data has just become available on inter-provincial railway transport of agricultural commodities. However, such data provides only a small part of the information on inter-provincial trade which moves largely by the trucking mode.

FIGURE 2

The British Columbia Food System



determined using published annual trade statistics. A possible source of benchmark information on the size of inter-provincial trade flows exists in Statistics Canada's 1974 Destination of Shipments of Manufacturers which shows the dollar value of manufactured shipments originating within each province and destined to other provinces. However, there were some serious limitations associated with that data. Shipments are reported only in terms of value, not quantity. Also, several commodity groups are not adequately reported because of the confidentiality requirements of the Statistics Act. Finally, the publication does not contain information on the value of foreign imports into any given province.

In view of the unavailability of adequate published information on trade, the approach of estimating total consumption by adding net foreign imports and net inter-provincial trade to local production, was discarded. An alternative approach to valuing British Columbia consumption would be to multiply the national per capita consumption estimates of each commodity by the province's population for a given year. Net trade is then derived as a residual by subtracting the production of a given commodity from the estimate of its consumption. Such an approach to measuring consumption had been employed in the O'Brien Study. The asumption underlying this approach, of course, is that the national per capita consumption averages accurately portray the consumption patterns within British Columbia. The present study adopts a similar approach. However, unlike the O'Brien study, an attempt was made to verify how well the national per capita consumption figures represent British Columbia's per capita consumption.

The only information source that could shed light on possible differences between Canadian and British Columbia per capita consumption levels is the Urban Family Food Expenditure Survey conducted every two years by Statistics Canada. Physical consumption as well as dollar expenditure patterns are reported for a sample of 500 families for the City of Vancouver (as well as for other major cities across Canada). The Survey covers a wide range of food items consumed at home. Rough comparisons were made between the consumption quantities reported by the Survey and the national per capita estimates. It was found that for most food groups the differences between the national average and the Vancouver average were small (within $\pm$ 5%). However, for particular items within groups there were significant differences between the consumption per person reported by the Survey and the national averages. This is to be to be expected since the ignoring of food waste at the retail level and the inclusion of food use by the food service industry in the national estimates should produce differences. Additionally, differences in regional consumption patterns should result in some difference. For one major item, beef, a direct comparison between the Vancouver and national average was not possible because per capita consumption quantities are reported in terms of wholesale (i.e. carcass) weight in the national estimates, and in terms of retail weight by the Survey.

The idea of using the Vancouver Survey data as a surrogate for provincial consumption was dismissed because of other limitations of the Survey data. First, although the Survey covers a wide range of food items, it only presents a partial picture of consumption within British Columbia. It does not define commodities for a significant and rising portion (about 35% in 1978) of food expenditures, principally food consumed away from home (see Appendix). Since the composition of meals consumed away from home tends to be

different from the composition of meals consumed at home, the pattern of food quantities consumed overall would probably be different to the pattern of food consumed at home. Second, the Survey only covers Vancouver and thus does not include the eating patterns of over half the population of the province, especially the population in small urban centres and in rural areas who tend on average to purchase lesser quantities of food than are purchased on average in large cities. Finally, the Survey is conducted biennially which requires estimates to be made by interpolation for the years in between, and by extrapolation, using some restrictive assumptions, for the years beyond 1978 (the most recent year for which data are available). Because of these limitations of the Survey data, the valuation of provincial consumption was based directly on the national per capita consumption estimates for individual commodities.

The sensitivity of the results, based on the foregoing valuation, to possible variations in regional consumption was tested however, for selected years. A ratio of the Vancouver quantities purchased data to the many-cities average in the Survey for each food group was calculated on the basis that such a ratio would reflect regional food tastes, and then applied to the sectoral consumption quantities. The test indicated that in nearly all the commodity sectors the national per capita consumption estimates overstated regional consumption, the effect ranging from 2-15 percent. The results were consistent for the different years selected for the test. This may suggest that both the sectoral ratios and the overall value ratio determined by the study are underestimates. However, the test results cannot be taken as conclusive. The inter-city average published by the Survey and used for calculating the test regional ratios that were applied, is not statistically a true interprovincial (or national) average. The number of cities represented per province varies in the average, and the average needs to be

weighted by the provincial populations in order that each province (British Columbia included) is given its correct weight. Even then, the underlying limitation of the ratio -- that it presents only a partial picture of regional consumption -- should be borne in mind.

iv) The Aggregation of Production/Consumption

In addition to the sectoral ratios developed on a quantity and value basis an overall ratio was developed by aggregating production and consumption across commodities on a value basis. For aggregation on a quantity basis, an acceptable and useful way of bringing together diverse commodities in a common physical measure is required. Estimates based on concepts such as nutritional content, or food energy (i.e. calorie) content, are equally valid. In the absence of a broadly based consensus on what should be an appropriate overall quantity measure, and since time did not permit the development of several such measures, it was decided to limit the study to finding an overall ratio only in terms of dollar value. The overall value ratio was defined, however, both to exclude and to include fish, a commodity of non-agricultural origin. This enables British Columbia's agricultural production/consumption ratio, and its overall food production/consumption ratio, to be determined separately.

The overall value ratio which is estimated is not all-inclusive. Those commodities outside the defined food groups which are classed under "Other" in the study do not include all remaining uncategorized food items consumed within British Columbia. Many small items (e.g. spices), for which adequate data do not exist, are excluded. A check on the value of such items revealed that in total, they are an insignificant percentage of total consumption. A conceptual

issue that might be raised, nonetheless, is whether food products which cannot be replaced by domestic agriculture directly, or by the substitution of a provincial product, should be included at all in computing an overall ratio. In this category are imported tropical products such as tea, coffee, cocoa, spices, rice, etc. which are widely consumed within the province. The exclusion of these commodities would yield an "attainable", as distinct from an actual, production/consumption ratio. Whether or not such commodities should be included in the overall ratio depends on the purpose for which the ratio is to be used -- whether to determine the extent of the independence from out-of-province supplies, or to identify opportunities for import replacement by provincial products (and thereby, ultimately, the potential future resource needs of the agricultural industry). Because of the conceptual problems involved in identifying imports for which there are substitutable provincial products not necessarily identical to the import, the present study is limited to determining only the actual production/consumption ratio, and not the attainable production/consumption ratio as well.

Interpretation of Results

The value estimates of production and consumption in this study are expressed in wholesale dollar values and the quantity estimates in imperial weight (pounds). Reporting of value is done in current dollars. The latter allows for a comparison of the relative importance of different commodities in the same year, but for comparisons between years, the reader should make adjustments for the effects of inflation by deflating with an appropriate price index.

The first six tables of the report show the production/consumption ratios for each commodity sector, and the aggregate ratios both including and excluding fish.

Tables 1 and 4 in particular should be interpreted with care. For example, increases noted in the sectoral weight ratios could be due to an abnormally good production year and/or a sharp decrease in demand. Similarly, the value ratio can be affected by changes in prices as well as changes in output and consumption. This is best illustrated in the fish sector where there was a fall in the fish catch in 1980 which accompanied a drastic fall in prices and produced a very large decrease in the sectoral value ratio which, in turn, affected the overall ratio. Because of such influences, it is suggested that three year averages be used when the long term behavior of the consumption/production ratio is being considered. Furthermore, attention should be paid to the output and demand components when a ratio changes significantly in the short term. The totals shown in the tables may not equal the sum of components due to rounding error.

SUMMARY OF RESULTS AND CONCLUSIONS

Tables 1 through 6 show the total production/consumption ratios of the commodity sectors covered in this report with the exception of the 'non-food' sectors. Total production and consumption is shown in wholesale dollars (Tables 1-3) and pounds (Tables 4-6). Table 1 which shows the value of production as a per cent of consumption, overall as well as for the various sectors, portrays the ability of British Columbia's agricultural industry to expand output in step with the expanding demand for food. Table 4 shows the corresponding weight ratios but only for the commodity sectors. Table 3 supports Table 1 and shows the actual dollar values of production and consumption for the different sectors and overall. Table 6 supports Table 4 and shows the actual total quantities produced and consumed in millions of pounds. Table 5 converts these quantities to a per capita basis to eliminate the effect of changes in population.

It will be noted from Table 1 that the overall food production/consumption ratio fluctuates considerably from year to year. This is largely due to the fact that fish, a sector in which prices and total catch vary considerably, makes up a significant proportion of total food production. When fish is not included (as shown in the first column of the table) the fluctuations are much less noticeable and some trends can be discerned.

A broad check on the validity of the overall value ratio determined by the study is provided by the findings of the Pearson paper of 1976 which estimated a value ratio of 43 per cent. When corrections are made for the deficiencies of that study by the explicit inclusion of beef cattle exports (which it had been assumed were a part of normally reported beef

TABLE 1

Production As A Percent Of Consumption

BY VALUE

	TOTAL	Total (Less fish)	Red Meat	Poultry and Eggs	Dairy Prod.	Fruits	Vegetables	Fish	Grains	Other
1961	79.4	55.4	34.0	86.2	82.8	84.4	64.0	3,900.0	-	20.6
1971	76.8	67.0	38.8	98.3	73.3	82.4	46.7	857.1	-	22.0
1975	66.5	51.1	20.5	88.9	80.0	102.1	41.0	982.4	-	28.8
1976	78.8	51.2	21.9	90.4	76.1	97.9	57.5	961.3	-	22.8
1977	85.4	54.6	22.8	86.5	76.2	95.5	55.7	1,033.3	-	26.6
1978	89.2	53.1	28.9	91.5	73.6	104.1	55.8	1,036.0	-	26.7
1979	86.8	52.6	29.6	92.2	76.6	80.6	56.1	775.3	-	35.9
1980	71.1	56.2	31.7	86.2	73.9	110.6	48.4	694.6	-	27.5

Sources: B.C. production divided by B.C. consumption. The levels of production and consumption are taken from the detailed sector tables.
B.C. grain production is assumed to be used as animal feed only and so is not included. Imports of grain for human use, and imports in excess of production for feed use are included, however, in the overall value of consumption. The first column includes fish and all the other sectors. The column "Other" includes "Miscellaneous" food items but does not include "Non-Food Items".

TABLE 2

The Wholesale Food Dollar

Percent of Production/Consumption Value

	TOTAL	Meat	Poultry	Dairy	Fruits	Vegetables	Fish	Grains	Other
1961	.79/$1.00	.10/.30	.08/.09	.22/.27	.08/.10.	.05/.08	.24/.01	-/.06	.02/.10
1971	.77/$1.00	.11/.28	.11/.11	.20/.27	.08/.09.	.04/.08	.22/.03	-/.04	.02/.11
1975	.67/$1.00	.06/.28	.09/.10	.19/.24	.10/.09.	.03/.08	.16/.02	-/.07	.03/.11
1976	.79/$1.00	.06/.27	.11/.12	.20/.26	.09/.09.	.04/.07	.28/.03	-/.05	.03/.12
1977	.84/$1.00	.06/.25	.10/.11	.21/.25	.09/.09.	.05/.08	.31/.03	-/.05	.04/.14
1978	.89/$1.00	.08/.28	.09/.10	.18/.25	.11/.10.	.04/.07	.36/.04	-/.04	.03/.11
1979	.87/$1.00	.09/.29	.09/.10	.19/.25	.08/.10.	.04/.07	.34/.04	-/.04	.04/.10
1980	.71/$1.00	.08/.26	.10/.11	.20/.27	.12/.10.	.03/.07	.15/.02	-/.04	.03/.12

Sources: Percent of production value is obtained by dividing the value of B.C. production of the commodity by value of B.C. consumption of all commodities.
Percent of consumption value is obtained by dividing the value of B.C. consumption of the commodity by the value of B.C. consumption of all commodities.
B.C. grain production is assumed to be used as animal feed only and so is not included. Imports of grain for human use and imports in excess of production for feed use are shown however and included in the overall value of consumption. "Other" includes "Miscellaneous" food items but does not include "Non-Food Items".

TABLE 3

B.C. Net Production/Consumption

($,000,000 - wholesale value)

	B.C. Population (,000,000's)	Total	Red Meat	Poultry and Eggs	Dairy Prod.	Fruits	Vegetables	Fish	Grains	Other
1961	1.63	258/325	33/97	25/29	72/87	27/32	16/25	78/2	-/19	7/34
1971	2.19	420/547	59/152	58/59	107/146	42/51	21/45	120/14	-/21	13/59
1975	2.44	685/1,030	59/288	96/108	196/245	98/96	34/83	167/17	-/35	34/118
1976	2.47	849/1,077	63/288	113/125	210/276	94/96	42/73	298/31	-/61	29/127
1977	2.50	1,030/1,206	68/298	115/133	231/303	106/111	54/97	372/36	-/55	46/173
1978	2.53	1,280/1,435	118/408	130/142	259/352	153/147	58/104	518/50	-/64	44/165
1979	2.57	1,437/1,656	143/483	153/166	314/410	137/170	64/115	566/73	-/72	60/167
1980	2.64	1,226/1,724	144/454	163/189	348/471	199/180	59/122	257/37	-/67	56/204

Sources: Information from totals in detailed sector tables.
B.C. grain production is assumed to be used as animal feed only and so is not shown. Imports of grain for human use and imports in excess of production for feed use, are shown however, and included in the overall value of consumption. "Other" includes "Miscellaneous" but does not include "Non-Food Items".

TABLE 4

Production As A Percent of Consumption

WEIGHT

	Red Meat	Poultry and Eggs	Dairy Prod.	Fruits	Vegetables	Fish	Grains	Other
1961	40.3	115.1	83.1	108.0	50.2	3,180.0	-	1.1
1971	25.2	101.9	74.0	75.2	43.3	873.1	-	4.1
1975	23.4	90.8	67.0	93.6	40.0	961.3	-	5.9
1976	23.6	92.4	64.4	87.6	47.4	962.5	-	2.9
1977	22.4	91.1	65.7	80.7	46.9	1,040.5	-	8.8
1978	23.7	93.4	63.4	81.2	40.0	1,039.0	-	12.5
1979	25.8	97.2	65.4	75.0	44.8	766.7	-	24.4
1980	28.6	88.3	66.2	98.1	36.9	686.4	-	11.8

Sources: B.C. production divided by B.C. consumption. The levels of production and consumption are taken from the detailed sector tables. The first column includes fish and all the agricultural commodities. The column "Other" includes "Miscellaneous" food items but does not include "Non-Food Items".

TABLE 5

B.C. Per Capita Production/Consumption

(in lbs.)

	Red Meat	Poultry and Eggs	Dairy Products	Fruits	Vegetables	Fish	Grains	Other
1961	53/132	61/53	515/620	181/168	169/337	390/12	-/662	2/164
1971	40/161	73/72	578/583	145/192	137/316	104/12	-/417	7/177
1975	39/188	65/71	385/575	215/230	139/347	122/13	-/542	10/166
1976	41/175	69/75	375/582	218/249	153/323	156/16	-/388	5/166
1977	38/170	69/75	381/579	189/234	152/324	175/17	-/434	17/163
1978	39/165	73/78	377/595	195/240	132/336	168/16	-/541	24/169
1979	41/160	81/83	392/600	182/242	161/358	125/16	-/519	47/164
1980	47/165	77/84	395/597	240/244	133/360	114/17	-/375	22/169

Sources: For production, information is from totals in detailed sector tables divided by the B.C. population in those years.
For consumption, information is from Statistics Canada, per capita disappearance of food in Canada. Tomatoes are included in Vegetables rather than in Fruits. B.C. grain production is assumed to be used as animal feed only and so is not shown. Imports of grain for human use and imports in excesss of production for feed use are shown however, on the consumption side. "Other" includes "Miscellaneous" food items but does not include "Non-Food Items".

TABLE 6

B.C. Net Production/Consumption

(,000,000 lbs.)

	B.C. Population (,000,000's)	Meat	Poultry	Dairy	Fruits	Vegetables	Fish	Grains	Other
1961	1.63	87/216	99/86	841/1,012	296/274	276/550	636/20	-/1080	3/268
1971	2.19	89/353	160/157	944/1,276	316/420	299/691	227/26	-/913	16/387
1975	2.44	96/411	158/174	938/1,401	524/560	339/847	298/31	-/1324	24/404
1976	2.47	102/433	171/185	926/1,437	538/614	378/798	385/40	-/959	12/411
1977	2.50	95/424	173/190	950/1,446	471/584	379/808	437/42	-/1085	36/408
1978	2.53	99/417	185/198	956/1,507	493/607	335/838	426/41	-/1369	53/423
1979	2.57	106/411	207/213	1,010/1,544	467/623	413/921	322/42	-/1334	103/422
1980	2.64	124/433	204/231	1,044/1,578	633/645	351/951	302/44	-/990	49/416

Sources: Information from totals in detailed sector tables. B.C. grain production is assumed to be used as animal feed only and so is not shown. Imports of grain for human use and imports in excess of production for feed use are shown, however, on the side of consumption. "Other" includes "Miscellaneous" food items but does not include "Non-Food Items".

production), and by the use of more appropriate conversion factors for dairy products, the Pearson estimate of the overall production/consumption ratio increases to about 60 per cent, which is within range of the ratio estimated for 1974 by this study.

Conclusions

Table 1 indicates that whereas the overall food production/consumption ratio has tended to fluctuate, the trend in the overall agricultural production/consumption ratio has been steadily upward since 1975. The latter ratio rose from 51.1 per cent in 1975 to 56.2 in 1980 in spite of significant changes occurring in population in that period. However, Table 5 reveals that in the case of particular sectors such as red meat and vegetables, which have considerable potential for increases in per capita consumption as real incomes rise, production for most years has responded only slightly toward a dynamic provincial demand. With regard to the future, population forecasts indicate that the ability of British Columbia's agricultural industry to meet the demand for food will continue to be challenged especially through a steady inflow of people to the province. However, there will also be incentives to increasing domestic production resulting from higher transportation costs due to higher fuel prices, which will add to the cost of imported foods.

Suggestions for Future Research

The main problem encountered in this study has been the establishment of accurate food consumption estimates for the province. Provincial food consumption was approximated by using national per capita consumption estimates which were

then combined with provincial population figures. However, the assumption that the national per capita consumption figures accurately reflect the consumption patterns within the province is open to question. Better knowledge on the extent and direction of bias, if any, in the consumption estimates can be obtained through developing and applying to the consumption estimates for each sector, a correctly weighted regional consumption ratio of the quantities purchased data for Vancouver to the inter-city average of such data as reported in the Urban Family Food Expenditure Survey. Developing such a ratio requires, first, that the inter-city average in the Survey, presently calculated with a varying number of cities per province, be population weighted in order to yield a more accurate interprovincial (or national) average to which the Vancouver data can be related as a ratio.

A complementary exercise that could reveal the biases (if any) in the national per capita consumption estimates is a direct statistical comparison of the national per capita consumption estimates and the quantities purchased per person data in the Urban Family Food Expenditure Survey for Vancouver. The national estimates are derived from a balance sheet of the gross supply and disposition of each food item. The disposition of supply in the balance sheet will need to be adjusted to permit a comparison of the national estimates with the Survey results. One adjustment is to take out food use by the food service industry since the Survey does not define commodity quantities for away-from-home consumption. Other necessary adjustments are to allow for food waste at the retail level for all products, and for waste up to the retail level for meat and poultry, which are calculated on a carcass and eviscerated basis. These latter adjustments may be based on information on waste factors obtainable from the food service industry. All such adjustments to the national

consumptions estimates should be performed in close consultation with Statistics Canada, which assembles information for, and prepares, the national estimates. The adjustments should eliminate the major sources of difference between the national estimates and the purchased quantities reported in the Food Expenditure Survey. Any differences that remain will essentially reflect regional food tastes. Some check on the representativeness of the Survey data itself may be warranted, as the Survey does not show purchases by households in rural and smaller urban areas of the province. It may be necessary to carry out some small surveys in areas of the province not covered by the Family Food Expenditure Survey to determine whether the results of the latter are valid for the province as a whole.

In the long term, more reliable information on consumption needs to be developed. There are two approaches which could provide such information. The first would be a direct measurement of consumption patterns through a periodic provincial food consumption survey similar to Statistics Canada's Urban Family Food Expenditure Survey, but with a sample extending to all areas of the province. Additionally, there should be some attempt to survey food use in hotels, restaurants and institutions. Conducting such an extended survey of food consumption could be costly. The alternative approach would be to develop information on trade, especially inter-provincial trade, which could be combined with production to build an estimate of total consumption. The flow of food into and out of the province may be monitored either by surveying the major distributors as was done in the Destination of Manufactured Goods Survey by Statistics Canada, or by some other method such as sampling of food cargo manifests. Since published data on the inter-provincial movements of goods by rail has recently become available, only the sampling of cargo manifests at truck entry points into the province is necessary. Such surveys

will not be useful unless information is obtained in a relatively complete form (i.e. reported by weight as well as value, with an indication of the origin and destination of goods). The monitoring of truck weighing stations holds some promise. Coverage of the five B.C./Alberta border highways by weigh stations appears to be fairly complete as the stations are open 20 to 24 hours daily. By this means, the net flow of goods between British Columbia and Alberta could be fairly accurately determined. However, the success of such a survey requires the co-operation of truckers in obtaining information in cargo manifests. Should any large food chain operating in B.C. and using its own trucks to ship in food merchandise, decide not to co-operate, the success of the survey would be severely affected.

A second, but lesser problem encountered in this study concerned the availability of information on the volume of manufactured goods and wholesale prices. While value and volume information was very complete at the farm gate level, it was surprisingly limited at the wholesale level. Information on goods requiring processing is obtained through the questionnaires used by Statistics Canada for the Census of Manufacturers, but is difficult to access because of the confidentiality requirements of the Statistics Act. For goods that do not require processing (such as fresh fruits and vegetables), annual wholesale price information can be obtained from the B.C. Ministry of Industry and Small Business Development's External Trade Report, by dividing the total value of a given commodity shipped through British Columbia customs ports by the total volume. It is desirable that wholesale prices be treated as "free" information, but where such prices cannot be obtained from established sources the establishment of some method of provincially recording average annual wholesale prices would greatly enhance the accuracy of future studies of this nature.

Finally, an overall ratio based on a valid physical criterion needs to be developed to supplement the aggregate value ratio estimated in this study. The disadvantage of the value ratio is that it makes the levels and patterns of food consumption between years largely dependent on market forces. Physical criteria, such as the energy content of food or the nutritional content of food, are equally valid. Evidence in high income economies suggests that as disposable incomes grow and the pattern of dietary composition changes, the energy content of the diet remains relatively constant especially over the short-to-medium term. The total quantity of agricultural production required to produce the energy content of the diet will change, however, producing changes in the ratio that tend to reflect the output contribution of British Columbia agriculture. The use of nutritional criteria, on the other hand, is advantageous in achieving a more efficient use of domestic resources for food production since current levels of food intake are determined largely by market forces. However, for the purpose of measurement, using such criteria will result in as many ratios as there are nutrients and make overall comparison between years difficult, unless an average nutritional diet for British Columbia is formulated. This is a normative question. If conversion to a nutritional basis is desired, the nutritional standards prescribed by Health and Welfare Canada might be adopted for a start.

NOTES ON MEAT PRODUCTION AND CONSUMPTION

METHOD

Raising weaned calves to the point where the animal is to be finished on a feedlot is referred to as "backgrounding". About a third of B.C. cattle (by weight) are raised on forage, then shipped to other provinces either to be "finished" (ie: fattened) on grain and then slaughtered, or, in the case of feeder calves, to be further backrounded then finished and slaughtered. Since much of the provincial beef production takes this form, the column labeled "Net B.C. Production" reflects this contribution to value-added by adding the value of B.C.'s net live exports to the slaughter value.

Statistics Canada consumption estimates were used for all meats, although the Urban Family Food Expenditure Survey suggests that B.C. beef consumption was about 10% less than the national average in the 1976 and 1978 reporting years.

Since data for B.C./U.S. carcass movements are not available, an estimate was derived from the difference of B.C. consumption and B.C. slaughter and labeled "Net Processed Imports". This label is used broadly, since the implicit assumption is that all meat imported is processed at the slaughterhouse. This is incorrect since the majority of "processed" meat is imported or exported in bulk (ie. carcasses) and then further processed (ie. broken down and packaged) at the destination. For example: imported frozen beef constitutes a substantial proportion of the raw materials used by B.C. meat processing plants; B.C. retail stores impart an additional value-added to Alberta boxed beef when they further cut up and package the product. Therefore, estimates of carcass movement should be treated carefully especially when considering the dollar value of processed meats. Since meat undergoes so many different stages of processing (and value added) all values are expressed at the slaughterhouse level.

Some idea of the size and nature of the B.C. meat processing industry is given in the table below:

B.C. MEAT PROCESSING INDUSTRY

	Value of Shipments (,000,000 $)	Inputs (,000,000 lbs)			
		Slaughter	Fats	*Residual	TOTAL
1961	145	112	N/A	N/A	564
1971	117	75	85	77	237
1975	209	77	89	156	322
1976	223	68	103	291	462
1977	227	76	127	187	390
1978	294	75	124	198	397
1979	310	73	126	225	424
1980	350	96	N/A	N/A	475

* The main component of this residual is imported frozen beef

Source: Statistics Canada, Census of Manufacturers, contact Central Statistics Bureau for more complete breakdown of inputs and outputs.

TRENDS

Until 1976 there had been a long term increase in the annual per capita consumption of beef. According to Statistics Canada the per capita disappearance of beef and veal consumption rose steadily from 76.5 lbs. in 1961 to a high of 118 lbs. in 1976, but declined thereafter to a current level of 90.8 lbs. Rising beef prices and the low relative price of pork have contributed to reduced consumption, and the prospect of higher future prices will probably continue to hold down consumption.

The supply of pork has expanded greatly in North America in recent years. Canadian farmers expanded production in response to an anticipated 10 - 14% reduction in U.S. pig numbers but instead, the reduction was more on the order of 5%. As a result, the total B.C. slaughter in 1980 was almost three times what it was in 1977 and the 1981 outlook is for an increase of 37% above the 1980 slaughter. Because of this, there have been lower prices and an increased quantity demanded of pork.

Lamb has remained a small and stable portion of the market. B.C. supplies very little of this particular market with the majority of lamb being imported in frozen form from Australia and New Zealand.

TABLE 7

Meats

Distribution of Net B.C. Production by Weight

	Total	Beef	Pork	Lamb
1961	100%	92.5	6.2	1.3
1971	100%	92.0	6.7	1.3
1975	100%	87.6	11.5	.9
1976	100%	90.4	8.9	.7
1977	100%	85.0	14.2	.8
1978	100%	80.0	19.3	.7
1979	100%	79.5	19.7	.7
1980	100%	69.4	29.9	.7

Sources: Net commodity production divided by total production

Distribution of Net B.C. Production by Value

Total	Beef	Pork	Lamb
$1.00	.94	.06	-
$1.00	.92	.07	.01
$1.00	.83	.16	.01
$1.00	.86	.14	-
$1.00	.84	.15	.01
$1.00	.84	.15	.01
$1.00	.86	.13	.01
$1.00	.79	.20	.01

Sources: Net commodity production value divided by total net production value.

TABLE 8

Meat

(,000,000 $ - wholesale)

	NET B.C. PRODUCTION			B.C.	PROCESSED		NET B.C.
	B C. SLAUGHTER	Net Live Trade	Net B.C. Production	CONSUMPTION	B.C. Slaughter/ B.C. Processed	Net Processed Imports	IMPORTS
1961	39.7	- 6.4	33.3	97.1	39.7	57.4	63.8
1971	43.9	+15.1	59.0	152.4	43.9	108.5	93.4
1975	50.0	+ 9.3	59.3	288.4	50.0	238.4	229.1
1976	43.6	+19.4	63.0	287.7	43.6	244.1	224.7
1977	53.0	+15.4	68.4	297.9	53.0	244.9	229.5
1978	85.6	+32.3	117.9	407.6	85.6	322.0	289.7
1979	90.1	+52.8	142.9	482.7	90.1	392.6	339.8
1980	102.1	+41.4	143.5	454.2	102.1	352.1	310.7

Sources: Sum of Beef, Pork, and Mutton tables. (Tables 9, 10, 11)

In the"Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 9

Beef (,000,000 $ - wholesale)

	NET B.C. PRODUCTION			4 B.C.	PROCESSED		7 NET
	1 B.C. SLAUGHTER	2 Net Live Trade	3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	B.C. IMPORTS
1961	26.1	+ 5.1	31.2	67.4	26.1	41.3	36.2
1971	35.3	+ 18.7	54.0	105.8	35.3	70.5	51.8
1975	36.8	+ 12.0	48.8	169.9	36.8	133.1	121.1
1976	34.1	+ 19.8	53.9	171.9	34.1	137.8	118.0
1977	41.6	+ 15.5	57.1	185.3	41.6	143.7	128.2
1978	66.6	+ 32.8	99.4	268.2	66.6	201.6	168.8
1979	69.9	+ 53.7	123.6	326.4	69.9	256.5	202.8
1980	72.2	+ 41.1	113.3	299.9	72.2	227.7	186.6

Sources:
1 Various sources, see working papers, Economics Branch, BC Ministry of Agriculture and Food.
2 Ibid. (Net international trade + net interprovincial trade).
3 Column 1 - Column 2, this is net production at the slaughter house level.
4 Derived from Statistics Canada, Canadian per capita disappearance figures (32-226).
5 Same as Column 1. This assumes that all B.C. slaughter is processed in B.C.
6 The difference between Column 4 and Column 5.
7 The difference between Column 4 and column 3.

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 10

Pork (,000,000 $ - wholesale)

	NET B.C. PRODUCTION			4 B.C.	PROCESSED		7 NET B.C.
	1 B.C. SLAUGHTER	2 Net Live Trade	3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	IMPORTS
1961	13.0	- 10.9	2.1	27.4	13.0	14.4	25.3
1971	8.0	- 3.7	4.3	42.6	8.0	34.6	38.3
1975	12.6	- 2.8	9.8	113.0	12.6	100.4	103.2
1976	9.0	- .5	8.5	110.6	9.0	101.6	102.1
1977	10.8	- .2	10.6	108.1	10.8	97.3	97.5
1978	18.0	- .7	17.3	131.8	18.0	113.8	114.5
1979	19.2	- 1.1	18.1	146.6	19.2	127.4	128.5
1980	28.8	- .1	28.7	146.9	28.8	118.1	118.2

Sources:
1 Various sources, see working papers, Economics Branch, BC Ministry of Agriculture and Food.
2 Ibid. (Net international trade + net interprovincial trade).
3 Column 1 - Column 2, this is net value at the slaughter house level.
4 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada (32-226).
5 Same as Column 1. This assumes that all B.C. slaughter is processed in B.C.
6 The difference between Column 4 and 5.
7 The difference between Column 4 and 3.

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 11

Mutton And Lamb

(,000,000 $ - wholesale)

	NET B.C. PRODUCTION				4 B.C.	PROCESSED		7 NLT
	1 B.C. SLAUGHTER	2 Net Live Trade		3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	B.C. IMPORTS
1961	.6	-	.6	.5[est.]*	2.2	.6	1.6	1.8
1971	.6		-	.6	3.9	.6	3.3	3.3
1975	.5	+	.1	.6	5.5	.5	4.9	4.9
1976	.6	+	.2	.8	5.1	.6	4.5	4.3
1977	.6	+	.2	.8	4.4	.6	3.8	3.6
1978	1.0	+	.2	1.2	7.7	1.0	6.7	6.5
1979	1.0	+	.3	1.3	9.7	1.0	8.7	8.4
1980	1.1	+	.5	1.6	7.5	1.1	6.4	5.9

Sources:
1 Various sources, see working papers, Economics Branch, BC Ministry of Agriculture and Food.
2 Ibid. (Net international trade + net interprovincial trade).
3 Column 1 - Column 2. This is net value at the slaughter house level.
4 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada (32-226).
5 Same as Column 1. This assumes that all B.C. slaughter is processed in B.C.
6 The difference between Column 4 and Column 5.
7 The difference between Column 4 and Column 3.

* This case illustrates the problem of assuming constant inventories. 1961 was apparently an abnormal year for B.C. imports from Alberta of live sheep. Net production, if calculated by subtracting live imports from slaughter would yield a value of only $64,000. The estimate of net value shown is based on the fact that current herd numbers are down about 25% from 1961.

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 12

Meat

(000,000 lbs. - cold dressed weight)

	NET B.C. PRODUCTION			4 B.C.	PROCESSED		7 NET
	1 B.C. SLAUGHTER	2 Net Live Trade	3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	B.C. IMPORTS
1961	112.2	- 26.3	87.0	216.2	112.2	104.0	130.3
1971	74.9	+ 13.6	88.5	352.8	74.9	277.9	264.3
1975	76.6	+ 18.9	95.5	411.2	76.6	334.6	315.7
1976	68.3	+ 33.4	101.7	433.2	68.3	364.9	331.5
1977	76.4	+ 19.0	95.4	423.9	76.4	347.5	328.5
1978	75.4	+ 23.9	99.3	416.7	75.4	341.3	317.4
1979	72.7	+ 33.5	106.2	411.0	72.7	338.3	304.8
1980	94.5	+ 29.4	123.9	432.8	94.5	338.3	308.9

Sources: Sum of Beef, Pork and Mutton tables. (Tables 13, 14, 15)

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 13

Beef

(000,000 lbs. - cold dressed weight)

	NET B.C. PRODUCTION			4 B.C.	PROCESSED		7 NET
	1 B.C. SLAUGHTER	2 Net Live Trade	3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	B.C. IMPORTS
1961	70.6	+ 9.9	80.5	124.8	70.6	54.2	44.3
1971	47.5	+ 33.9	81.4	203.5	47.5	156.0	122.1
1975	61.5	+ 22.2	83.7	274.0	61.5	212.5	190.3
1976	58.1	+ 33.9	92.0	291.4	58.1	233.3	199.4
1977	61.9	+ 19.1	81.0	280.8	61.9	218.9	199.8
1978	54.8	+ 24.6	79.4	265.5	54.8	210.7	186.1
1979	49.8	+ 34.6	84.4	236.5	49.8	186.7	152.1
1980	56.7	+ 29.3	86.0	239.9	56.7	183.2	153.9

Sources:
1 Various sources, see working papers, Economics Branch, BC Ministry of Agriculture and Food.
2 Ibid. (Net international trade + net interprovincial trade).
3 Column 1 - Column 2. This is net production at the slaughter house level.
4 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada (32-226).
5 Same as Column 1. This assumes that all B.C. slaughter is processed in B.C.
6 The difference between Column 4 and 5.
7 The difference between Column 4 and 3.

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 14

Pork

(000,000 lbs. - cold dressed weight)

	NET B.C. PRODUCTION			4 B.C.	PROCESSED		7 NET
	1 B.C. SLAUGHTER	2 Net Live Trade	3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	B.C. IMPORTS
1961	40.0	- 34.7	5.3	85.6	40.0	45.6	80.3
1971	26.4	- 20.4	6.0	142.2	26.4	115.8	136.2
1975	14.4	- 3.3	11.1	129.9	14.4	115.5	118.8
1976	9.7	- .7	9.0	136.6	9.7	126.9	127.6
1977	13.8	- .3	13.5	138.6	13.8	124.8	125.1
1978	19.9	- .8	19.1	146.4	19.9	126.5	127.3
1979	22.2	- 1.3	20.9	168.5	22.2	146.3	147.6
1980	37.2	- .2	37.0	188.3	37.2	151.1	151.3

Sources: 1 Various sources, see working papers, Economics Branch, BC Ministry of Agriculture and Food.
2 Ibid. (Net international trade + net interprovincial trade).
3 Column 1 - Column 2. This is net production at the slaughter house level.
4 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada (32-226).
5 Column 1. This assumes that all B.C. slaughter is processed in B.C.
6 The difference between Column 4 and Column 5.
7 The difference between Column 4 and Column 3.

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

TABLE 15

Mutton And Lamb

(000,000 lbs. - cold dressed weight)

	NET B.C. PRODUCTION			4 B.C.	PROCESSED		7 NET
	1 B.C. SLAUGHTER	2 Net Live Trade	3 Net B.C. Production	CONSUMPTION	5 B.C. Slaughter/ B.C. Processed	6 Net Processed Imports	B.C. IMPORTS
1961	1.6	+ 1.6	1.2[est.]*	5.8	1.6	4.2	4.6
1971	1.1	- .1	1.0	7.1	1.1	6.0	6.1
1975	.7	- .1	.6	7.3	.7	6.6	6.7
1976	.6	- .2	.4	5.2	.6	4.6	4.8
1977	.6	- .2	.4	4.5	.6	3.9	4.1
1978	.6	- .1	.5	4.8	.6	4.2	4.3
1979	.6	- .2	.4	6.0	.6	5.4	5.6
1980	.7	- .3	.4	4.6	.7	4.6	4.2

Sources: 1 Various sources, see working papers, Economics Branch, BC Ministry of Agriculture and Food.
2 Ibid. (Net international trade + net interprovincial trade).
3 Column 1 - Column 2. This is net production at the slaughter house level.
4 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada (32-226).
5 Column 1. This assumes that all B.C. slaughter is processed in B.C.
6 The difference between Column 4 and 5.
7 The difference between Column 4 and 3.

* This case illustrates the problem of assuming constant inventories. 1961 was apparently an abnormal year for imports from Alberta of live sheep. Net production, if calculated by subtracting live imports from slaughter, would yield a quantity of only 55,000 lbs. The estimate of net production shown is based on the fact that current herd numbers are down about 25% from 1961.

In the "Net Trade" column, "+" indicates net B.C. export, "-" indicates net B.C. imports.

NOTES ON POULTRY PRODUCTION AND CONSUMPTION

METHOD

Except for shell eggs and live poultry, data on inter-provincial movement of poultry produce were unavailable. This interprovicial trade in poultry produce was estimated as a residual by taking the difference between consumption and production. The weak link here is the consumption estimate, which is derived by multiplying Statistics Canada's Canadian per capita disappearance estimate by the B.C. population. However, the validity of these estimates is supported by the estimates in Urban Family Food Expenditure Reports of 1974, 1976 and 1978 which indicate that Vancouver's per capita consumption is about the same as the national average for these years.

TRENDS

There has been a large increase in per capita production and consumption of poultry in the last twenty years while the per capita production and consumption of eggs has declined slightly.

TABLE 16

Poultry And Eggs

Distribution of Net B.C. Production by Weight

	Total	Eggs	Chicken	Turkey	Fowl
1961	100%	62.1	22.1	7.9	7.9
1971	100%	52.2	30.2	13.1	4.5
1975	100%	49.2	34.3	11.3	5.2
1976	100%	47.1	37.2	11.8	3.9
1977	100%	48.1	36.1	11.4	4.4
1978	100%	44.6	41.3	10.5	3.6
1979	100%	41.6	45.3	9.7	3.4
1980	100%	43.1	41.9	10.1	4.9

Sources: Commodity production dividied by total production.

Distribution of Net B.C. Production by Value

	Total	Eggs	Chicken	Turkey	Fowl
1961	$1.00	.60	.22	.10	.08
1971	$1.00	.46	.35	.18	.01
1975	$1.00	.46	.39	.14	.01
1976	$1.00	.43	.41	.15	.01
1977	$1.00	.44	.41	.15	-
1978	$1.00	.39	.45	.15	.01
1979	$1.00	.36	.48	.15	.01
1980	$1.00	.39	.45	.15	.01

Sources: Commodity production value divided by total production value.

TABLE 17

Total Poultry And Shell Eggs

(000,000 $ - wholesale)

	Net Trade			B.C. Production			B.C. Consumption		
	Poultry	Eggs	Total	Poultry	Eggs*	Total	Poultry	Eggs	Total
1961	- 4.1	- .3	- 4.4	10.0	15.0	25.0	14.1	15.3	29.4
1971	- 7.0	+ 6.4	- .6	31.2	27.0	58.1	38.2	20.6	58.7
1975	- 15.2	+ 3.3	- 11.9	52.0	44.2	96.2	67.1	40.9	108.0
1976	- 13.9	- 1.7	- 12.2	64.6	48.4	113.1	78.5	46.1	124.6
1977	- 22.6	- .4	- 23.0	64.6	50.8	115.4	87.2	46.2	133.4
1978	- 14.5	- .7	- 15.2	79.7	50.7	130.4	94.4	47.1	141.5
1979	- 12.8	- 2.7	- 15.5	97.6	55.2	152.9	110.4	55.1	165.5
1980	- 26.0	- 4.4	- 26.5	99.5	63.5	162.9	125.5	63.9	189.4

Sources: Sum of Egg, Chicken, Turkey and Fowl Tables.

* Egg production before CEMA buy-back.
"Net Trade" shown here for Eggs is not the difference between Production and Consumption since CEMA buy-back is not included.

TABLE 18

Shell Eggs

(,000,000 $ - wholesale)

	1 Prices Per Dozen (¢)	2 Interprov. Imports	3 Interprov. Exports	4 Net Trade	5 B.C. Prod.	6 CEMA Buy-Back	7 Marketed B.C. Production	8 B.C. Cons.
1961	36.5	.3	-	- .3	15.0	-	15.0	15.3
1971	48.4	N/A	N/A	+6.4	27.0	-	27.0	20.6
1975	83.5	N/A	N/A	+3.3	44.2	-	44.2	40.9
1976	90.4	N/A	N/A	-1.7	48.4	4.0	44.4	46.1
1977	91.5	1.2	.8	- .4	50.8	4.8	46.0	46.2
1978	92.3	1.3	.5	- .8	50.7	3.8	46.5	47.1
1979	99.3	2.8	.1	-2.7	55.2	3.6	51.6	55.1
1980	108.3	4.5	.1	-4.4	63.5	4.0	59.5	63.9

Sources:
1. Average wholesale price for grade A large eggs in the Vancouver market from Poultry Market Review, Table 5
2. Poultry Market Review, Table 12.
3. Ibid
4. The difference between Column 2 and Column 3. A negative sign denotes net imports and a positive sign denotes net exports. 1971, 1975 and 1976 figures are based on the difference between production and consumption.
5. Statistics Canada.
6. Poultry Market Review, Table 4.
7. Column 5 - Column 6.
8. Derived by adding (subtracting) net imports (net exports) in Column 4 to (from) production in Column 7. These estimates are consistent with the Urban Family Food Expenditure Survey data which is used to derive 1975 and 1976 figures. 1971 consumption is derived from Statistics Canada's per capita disappearance of food estimates.

TABLE 19

Chicken

(,000,000 $ - wholesale)

	1 Price Per Pound (¢)	2 Net Trade	3 B.C. Production	4. B.C. Consumption
1961	25.0	- 2.5	5.5	8.0
1971	41.9	- 6.3	20.3	26.6
1975	69.6	-11.8	37.7	49.4
1976	73.9	-11.5	46.8	58.3
1977	74.8	-16.1	46.7	62.8
1978	77.4	-10.8	59.0	70.0
1979	83.9	- 9.9	74.0	83.9
1980	86.5	-23.4	73.9	97.3

Sources: 1 Poultry Market Review, Table 5, average wholesale price for grade A eviscerated in the Vancouver Market.
2 The difference between Column 4 and Column 3. A negative sign denotes all imports and a positive sign denotes all exports.
3 Statistics Canada.
4 Derived from Statistics Canada's Canadian per capita disappearance of food figures.

TABLE 20

Fowl

(,000,000 $ - wholesale)

	1 Price Per Pound (¢)	2 Net Trade	3 B.C. Production	4 B.C. Consumption
1961	.24	+ .1	1.9	1.8
1971	.10	-	.7	.8
1975	.08	+ .1	.7	.6
1976	.10	-	.7	.7
1977	.11	+ .1	.9	.8
1978	.11	-	.7	.8
1979	.14	-	1.0	1.0
1980	.18	+ .6	1.8	1.2

Sources:
1 Weighted producer price of heavy and light fowl assuming a 1:8 distribution of production based on information provided by Dr., B. Gill, Agriculture Canada, Vancouver. These prices were doubled to approximate wholesale price.
2 The difference between Column 4 and Column 3.
3 Statistics Canada.
4 Derived from Statistics Canada's Canadian per capita disappearance of food figures.

TABLE 21

Turkey

(,000,000 $ - wholesale)

	1 Price Per Pound (¢)	2 Net Trade	3 B.C. Production	4 B.C. Consumption
1961	34.0	- 1.5	2.6	4.3
1971	48.0	- .7	10.1	10.8
1975	76.2	- 3.4	13.6	17.1
1976	86.7	- 2.2	17.5	19.5
1977	86.0	- 2.6	17.0	19.8
1978	102.6	- 3.6	20.0	23.6
1979	110.9	- 2.8	22.6	25.5
1980	115.0	- 3.3	23.8	27.0

Sources: 1 Average wholesale price for grade A eviscerated in the Vancouver market. Poultry Market Review, weighted average of Tables 8, 9 and 10.
2 The difference between Column 4 and Column 3.
3 Statistics Canada, Cansim.
4 Derived from Statistics Canada Canadian per capita disappearance figures.

TABLE 22

Total Poultry And Shell Eggs

(000,000 lbs. - evis. weight)

	Net Trade			B.C. Production			B.C. Consumption		
	Poultry	Eggs	Total	Poultry	Eggs*	Total	Poultry	Eggs	Total
1961	+ 14.4	- 1.4	+ 13.0	37.6	61.5	99.1	23.2	63.0	86.2
1971	- 16.9	+19.9	+ 3.0	76.5	83.6	160.1	93.5	63.8	157.3
1975	- 20.3	+ 4.3	- 16.2	80.2	77.8	158.0	100.5	73.5	174.0
1976	- 17.8	- 2.8	- 20.7	90.2	80.4	170.6	108.0	76.5	184.5
1977	- 24.0	- .6	- 24.6	89.9	83.2	173.1	114.0	75.8	189.8
1978	- 18.2	- 1.3	- 19.2	102.3	82.4	184.7	120.5	77.3	197.8
1979	- 2.4	- .1	- 6.1	123.3	83.4	206.7	129.5	83.3	212.8
1980	- 6.4	- .6	- 27.0	116.1	87.9	204.0	142.5	88.5	231.0

Sources: Sum of Egg, Chicken, Turkey and Fowl Tables.

* Egg production before CEMA buy-back.
"Net Trade" shown here for Eggs is not the difference between Production and Consumption since CEMA buy-back is not included.

TABLE 23

Shell Eggs

(,000,000 - dozens)

	1 Interprov. Imports	2 Interprov. Exports	3 Net Trade	4 B.C. Prod.	5 CEMA Buy-Back	6 Marketed B.C. Production	7 B.C. Consumption
1961	.9	-	.9	41.0	-	41.0	42.0
1971	N/A	N/A	+ 13.2	55.7	-	55.7	42.5
1975	N/A	N/A	+ 2.8	51.8	-	51.8	49.0
1976	N/A	N/A	- 1.9	53.6	4.5	49.1	51.0
1977	1.3	.9	- .4	55.5	5.2	50.3	50.5
1978	1.4	.6	- .9	54.9	4.1	50.8	51.5
1979	2.8	.1	- 2.7	55.6	2.6	53.0	55.5
1980	4.1	.1	- 4.1	58.6	3.6	54.9	59.0

Sources:
1 Poultry Market Review, Table 12.
2 Poultry Market Review, Table 12.
3 The difference between Column 1 and Column 2. 1971, 1975 and 1976 figures are estimates based on the difference between production and consumption.
4 Statistics Canada.
5 Poultry Market Review, Table 3.
6 Column 4 - Column 5.
7 Derived by adding (subtracting) net imports (net exports) in Column 3 to (from) production in Column 6. These estimates are consistent with the Urban Family Food Expenditure Survey data which is used to derive 1975 and 1976 figures. 1971 consumption is derived from Statistics Canada's per capita disappearance of food estimates.

TABLE 24

Chicken

(,000,000 lbs. - evis. weight)

	1 Net Trade	2 B.C. Production	3 B.C. Consumption
1961	- 10.0	21.9	32.0
1971	- 15.0	48.4	63.5
1975	- 17.0	54.1	71.0
1976	- 15.5	63.4	79.0
1977	- 21.5	62.5	84.0
1978	- 14.0	76.3	90.5
1979	- 4.4	95.6	100.0
1980	- 27.0	85.5	112.5 (est.)

Sources: 1 The difference between Column 3 and Column 2.
2 Statistics Canada.
3 Derived from Statistics Canada's Canadian per capita disappearance of food figures.

TABLE 25

Fowl

(,000,000 lbs. - evis. weight)

	1 Other Net Trade	2 B.C. Production	3 B.C. Consumption
1961	+ .4	7.9	7.5
1971	- .4	7.1	7.5
1975	+ 1.0	8.2	7.0
1976	+ .2	6.6	6.5
1977	+ .5	7.6	7.0
1978	- .4	6.6	7.0
1979	+ .5	7.3	6.5
1980	+ 3.5	10.0	6.5 (est.)

Sources: 1 The difference between Column 3 and Column 2. Includes net foreign eviscerated trade and all interprovincial trade.
2 Statistics Canada.
3 Derived from Statistics Canada, Canadian per capita disappearance of food figures.

TABLE 36

Turkey

(,000,000 lbs. - evis. weight)

	1 Net Trade	2 B.C. Production	3 B.C. Consumption
1961	- 4.5	7.8	12.5
1971	- 1.5	21.0	22.5
1975	- 4.5	17.9	22.5
1976	- 2.5	20.2	22.5
1977	- 3.0	19.8	23.0
1978	- 3.5	19.5	23.0
1979	- 2.5	20.4	23.0
1980	- 2.8	20.7	23.5(est.)

Sources: 1 The difference between Column 3 and Column 2.
2 Statistics Canada.
3 Derived from Statistics Canada, Canadian per capita disappearance of food figures.

DAIRY PRODUCTS PRODUCTION AND CONSUMPTION

METHOD

Inter-provincial movement of items such as fluid milk, cream and cottage cheese are considered to be negligible or nil. Additionally, B.C. produces what it consumes in ice cream and yogurt. Since the data for the inter-provincial movement of the remaining products (butter, cheeses and concentrates) are unavailable imports are estimated to be the difference between production and consumption.

Wholesale prices are derived from the Statistics Canada's Census of Manufacturers for the most part (value of shipments divided by production weight), and applied to both production and consumption. "Other cheese" prices are from the B.C. Ministry of Industry and Small Business Development's External Trade Report which may more accurately reflect the price and mix of cheese consumption than would B.C. production.

A problem exists in comparing different dairy products by weight, since they are constituted from different parts of whole milk in different ratios. Milk is made up of butter-fat, "other milk solids" and water. Other dairy products are made up of varying combinations of these three. Traditionally, consumption of dairy products is regarded in terms of butter-fat alone and is converted to whole milk equivalents on this basis. For B.C. however, conversion to whole milk on a butterfat basis tends to overstate consumption since the particular types of dairy products we consume contain a higher proportion of butterfat than other milk solids. For example: B.C. imports a high proportion of the total butter consumed in Canada which is about 80% butterfat and 20% water. To report consumption only in terms of butterfat ignores the fact that the milk solids separated from that milk during processing have alternative uses.

Whole milk contains about 3.6% butter-fat, 8.7% milk solids and 87.7% water, the latter of which in effect has no value. If total milk solids (12.3%) are considered instead of butter fat alone, then they can be converted back to whole milk at the rate of 8.13 lbs. of whole milk for every lb. of milk solids (100 / 12.3). This gives high butterfat items a lower and more accurate weighting.

The percentages of milk solids present in the retail weight of individual dairy products were obtained from the Dairyland testing laboratory in Burnaby B.C. and are as follows:

Retail Form	Total Solids
Butter:	82.0 %
Cheddar Cheese:	63.0
Ice Cream	22.36
Cottage Cheese:	8.4
Other Cheese:	55.0
Concentrates:	26.0
Powder:	96.0
Yogurt:	18.6

The estimate for total consumption of dairy products was derived by multiplying the retail consumption weight of each of the commodities by their respective milk solids content, multiplying this by 8.13 and adding fluid milk sales. Total production of milk is readily available from Statistics Canada but to test the validity of this whole milk conversion method, production was estimated in the same manner as consumption.

It was found that the total estimated production was close to actual production with the former exceeding the latter by about 5% in recent years. Conversations with staff of Statistics Canada in Ottawa indicate that some degree of double-counting exists which could account for this difference. Specifically, some of the reported production of butter is diverted from the retail market and is used in the production of ice cream. However, since the amount of butter devoted to manufacturing is not known, it is assumed that all production is consumed in the retail market. This tends to overstate consumption. The resultant dairy production/ consumption ratio in this study may, therefore, be somewhat understated.

A comparison of dairy products on a butter-fat basis yields a distorted picture, but to allow for comparison with other studies, total dairy production and an estimate of consumption are shown in whole milk equivalents on a butterfat basis in Table 33. On the next page is a table of butterfat conversion factors. It should be noted that products made from "other milk solids" (eg: powders, cottage cheese, etc.) must be neglected to avoid double-counting.

Retail Form	Lbs. of Whole Milk to Make 1 lb. of Retail Form
Milk:	1
Butter:	23.4
Cheddar Cheese:	11.0
Other Cheese:	10.0
	Lbs. of Whole Milk to Make 1 gal. of Retail Form
Ice Cream:	34.0
Concentrates:	(whole milk equivalent obtained direct from Statistics Canada, Ottawa)

Sources: Handbook of Agricultural Statistics, Part VII, Dairy Statistics.

Total dairy production when estimated by applying these factors showed actual production to be significantly understated (by about 25% in recent years). Such a difference is greater than can be attributed to the double-counting of butter and ice cream production. Therefore, consumption estimated on a butterfat basis should not be compared with actual production but with production estimated on the same basis as shown in column 4 of Table 33.

TRENDS

British Columbia produces about two-thirds of its domestic requirements of all dairy products including milk (in fluid equivalent) while the remainder is imported from other provinces, mainly in the form of cheese and butter. Although B.C. may have the capacity to supply the remaining one-third of the total market for diary products, production of non-fluid dairy products is restricted by federal market share quota on industrial milk. Since the bulk of milk produced in B.C. is absorbed in the fluid milk market where the returns are higher than in the industrial milk market British Columbia's output of dairy products has the appearance of a higher "value per pound" than what is consumed.

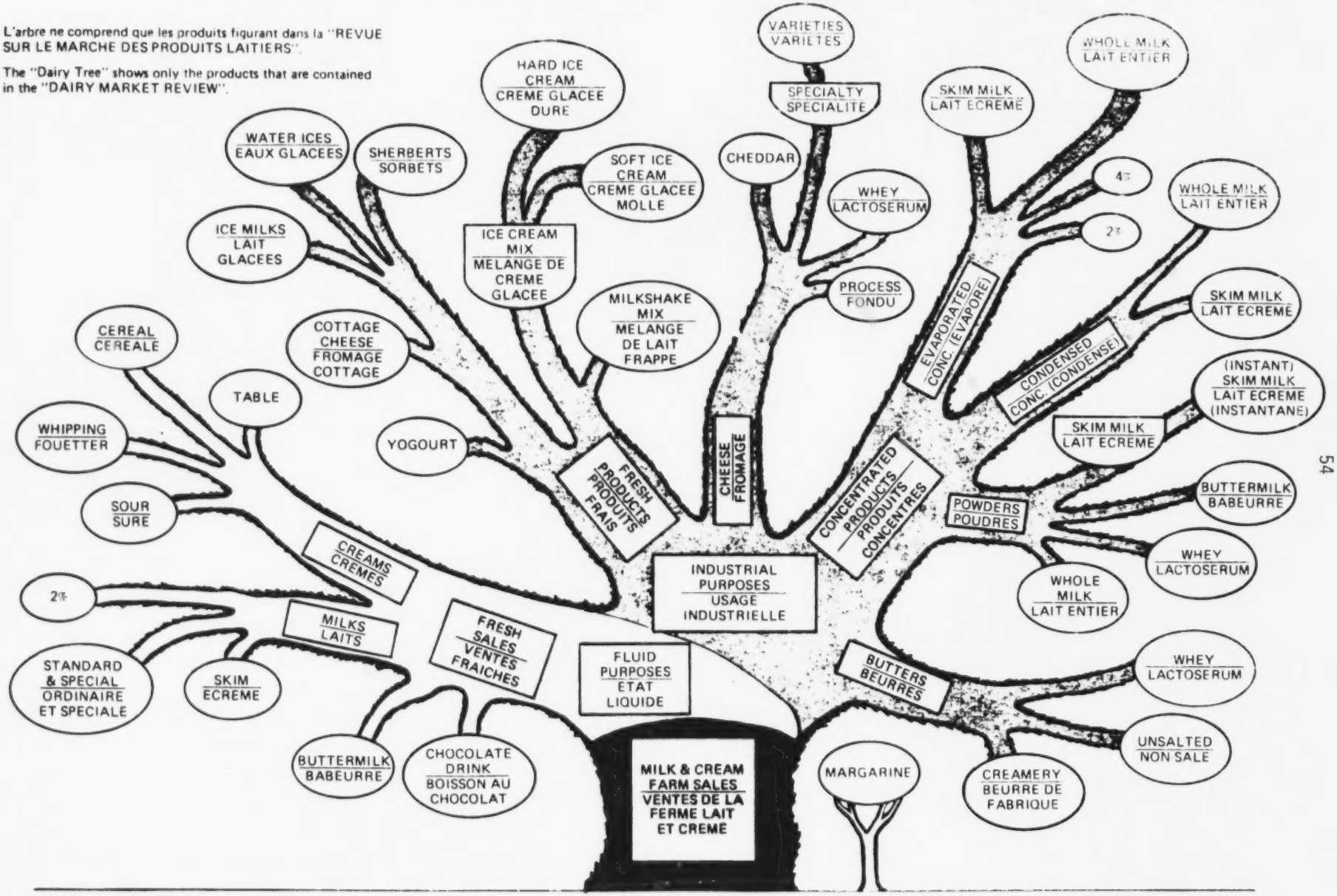
Over the last two decades there has been a large increase in the per capita consumption of yogurt and whey powder (the latter used in baking) while there has been a slow decline in the use of butter.

THE 1980 DAIRY MARKET REVIEW'S "DAIRY TREE"

L'ARBRE DE LA REVUE DES PRODUIT LAITIERS 1980

L'arbre ne comprend que les produits figurant dans la "REVUE SUR LE MARCHE DES PRODUITS LAITIERS".

The "Dairy Tree" shows only the products that are contained in the "DAIRY MARKET REVIEW".


VARIETIES / VARIETES
SPECIALTY / SPECIALITE
CHEDDAR
WHEY / LACTOSERUM
PROCESS / FONDU
HARD ICE CREAM / CREME GLACEE DURE
SOFT ICE CREAM / CREME GLACEE MOLLE
WATER ICES / EAUX GLACEES
SHERBERTS / SORBETS
ICE MILKS / LAIT GLACEES
ICE CREAM MIX / MELANGE DE CREME GLACEE
MILKSHAKE MIX / MELANGE DE LAIT FRAPPE
CEREAL / CEREALE
COTTAGE CHEESE / FROMAGE COTTAGE
TABLE
YOGOURT
WHIPPING / FOUETTER
SOUR / SURE
FRESH PRODUCTS / PRODUITS FRAIS
CHEESE / FROMAGE
CREAMS / CREMES
2%
MILKS / LAITS
STANDARD & SPECIAL / ORDINAIRE ET SPECIALE
SKIM / ECREME
BUTTERMILK / BABEURRE
CHOCOLATE DRINK / BOISSON AU CHOCOLAT
FRESH SALES / VENTES FRAICHES
INDUSTRIAL PURPOSES / USAGE INDUSTRIELLE
FLUID PURPOSES / ETAT LIQUIDE
MILK & CREAM FARM SALES / VENTES DE LA FERME LAIT ET CREME
MARGARINE
BUTTERS / BEURRES
CONCENTRATED PRODUCTS / PRODUITS CONCENTRES
POWDERS / POUDRES
EVAPORATED / CONC. (EVAPORE)
CONDENSED / CONC. (CONDENSE)
SKIM MILK / LAIT ECREME
WHOLE MILK / LAIT ENTIER
4%
2%
WHOLE MILK / LAIT ENTIER
SKIM MILK / LAIT ECREME
(INSTANT) SKIM MILK / LAIT ECREME (INSTANTANE)
SKIM MILK / LAIT ECREME
BUTTERMILK / BABEURRE
WHEY / LACTOSERUM
WHOLE MILK / LAIT ENTIER
WHEY / LACTOSERUM
UNSALTED / NON SALE
CREAMERY / BEURRE DE FABRIQUE

Agriculture Canada

MARKETING AND ECONOMICS BRANCH DIRECTION GENERALE DE LA COMMERCIALISATION DE L'ECONOMIE

TABLE 27

Total Dairy Products

(,000,000 $ - wholesale)

	1. Net Trade	2. B.C. Production	3. B.C. Consumption
1961	- 14.8	72.2	87.0
1971	- 38.5	107.3	145.8
1975	- 48.3	196.5	244.8
1976	- 65.7	210.3	276.0
1977	- 53.0	231.1	303.2
1978	- 97.9	259.1	352.1
1979	- 95.4	314.2	409.6
1980	-123.2	347.5	470.7

Sources: 1. Net Trade - Column 2 - Column 3.
2. Total of detailed tables.
3. Ibid.

TABLE 28

Dairy Products

(,000,000 $ - wholesale)

	Milk & Cream	Butter			Cheddar Cheese		
	Prod/Cons	Net Trade	B.C. Prod.	B.C. Cons.	Net Trade	B.C. Prod.	B.C. Cons.
1961	50.5	- 13.9	4.1	18.0	1.6	.5	2.1
1971	75.4	- 21.3	3.8	25.0	4.4	1.7	6.0
1975	137.1	- 24.4	6.6	31.0	8.8	4.2	13.0
1976	151.4	- 25.3	6.8	32.1	8.2	4.7	12.8
1977	166.1	- 24.4	7.1	31.5	7.5	5.2	12.7
1978	185.3	- 28.1	6.4	34.5	4.1	5.4	9.5
1979	227.5	- 29.5	9.0	38.5	6.0	8.4	14.4
1980	252.7	- 36.3	9.0	45.3	5.5	10.8	16.3

Sources: Production - Statistics Canada.
Consumption - Statistics Canada, Apparent Per Capita Disappearance of Food in Canada.

Price information is derived from the Census of Manufacturers, 1961. 1980 prices are estimated from Statistics Canada, The Consumer Price Index.

TABLE 29

Dairy Products

(000,000 $ - wholesale)

	Ice Cream Prod/Cons	Cottage Cheese Prod/Cons	Other Cheese Prod/Cons	Concentrates Prod/Cons	Powder Prod/Cons	Yogurt Prod/Cons	Total Prod/Cons
1961	6.7/4.9	1.4/1.4	N/A/ 1.0	N/A/ 4.4	N/A/ 4.6	N/A/ .1	17.0/ 16.4
1971	11.8/11.5	2.4/2.4	N/A/10.1	N/A/ 3.2	N/A 11.1	1.1/1.1	26.5/ 39.4
1975	18.9/18.7	5.0/5.0	N/A/16.1	N/A/ 8.7	N/A/13.1	2.7/2.3	48.6/ 63.7
1976	20.1/19.3	5.2/5.2	N/A/25.8	N/A/ 8.8	N/A/18.0	3.1/2.8	47.4/ 79.9
1977	22.2/21.1	5.8/5.8	N/A/31.4	N/A/12.9	N/A/17.8	4.7/4.0	52.7/ 92.9
1978	25.9/25.0	6.2/6.2	N/A/41.8	N/A/14.8	N/A/29.3	4.2/5.8	62.0/122.8
1979	27.3/26.4	7.1/7.1	N/A/44.1	N/A/12.9	N/A/32.9	6.3/5.8	69.3/129.2
1980	31.9/30.5	10.6/10.6	N/A/57.1	N/A/17.1	N/A/34.3	7.5/6.8	75.0/156.4

Sources: Statistics Canda, prices derived from Census of Manufacturers' survey.
Prices were not availble for "other cheese", concentrates and powders to comply with confidentiality requirements of the Statistics Act, however totals include all products.

TABLE 30

Total Dairy Products

(,000,000 lbs. - whole milk equiv.)

	1. Net Imports	2. B.C. Production	3. B.C. Consumption
1961	170.2	841.4	1,011.6
1971	331.8	943.9	1,275.7
1975	463.0	937.8	1,400.8
1976	510.9	925.9	1,436.8
1977	495.3	950.3	1,445.6
1978	550.6	956.0	1,506.6
1979	533.9	1,009.7	1,543.6
1980	534.4	1,044.0	1,578.4

Sources:
1. Net Trade - Column 2 - Column 3.
2. Production - Statistics Canada. Cansim, total fluid milk production.
3. Consumption - B.C. fluid sales plus an estimate for all other processed dairy products calculated in milk equivalents.

TABLE 31

Dairy Products

(,000,000 lbs. - retail weight)

	Milk & Cream	Butter			Cheddar Cheese		
	Prod/Cons	Net Trade	B.C. Prod.	B.C. Cons.	Net Trade	B.C. Prod.	B.C. Cons.
1961	449.6	- 19.9	5.9	25.7	- 3.4	1.2	4.5
1971	579.7	- 29.1	5.1	34.3	- 6.6	2.5	9.1
1975	660.9	- 22.2	6.0	28.2	- 7.3	3.5	10.8
1976	666.7	- 21.8	5.9	27.7	- 5.7	3.3	9.0
1977	679.1	- 19.3	5.6	25.0	- 4.8	3.3	8.1
1978	710.0	- 20.4	4.6	25.0	- 2.6	3.5	6.1
1979	745.0	- 19.4	6.0	25.3	- 3.3	4.7	8.0
1980	771.0	- 20.8	5.1	25.9	- 2.7	5.3	7.9

Sources: Production - Statistics Canada.
Consumption - Statistics Canada, Apparent per Capita Disappearance of Food in Canada.

TABLE 32

Dairy Products

(000,000 lbs. - retail weight)

	Ice Cream Prod/Cons	Cottage Cheese Prod/Cons	Other Cheese Prod/Cons	Concentrates Prod/Cons	Powder Prod/Cons	Yogurt Prod/Cons
1961	56.5/41.8	6.6/ 6.6	.1/ 2.3	40.5/28.8	8.3/14.9	.2/ .2
1971	70.0/68.4	8.0/ 8.0	.6/18.6	30.9/29.0	4.5/17.7	2.6/ 2.6
1975	77.9/76.8	9.0/ 9.0	.3/28.2	24.6/26.1	6.9/20.9	4.9/ 4.2
1976	78.9/75.8	8.7/ 8.7	.5/30.3	18.2/25.3	6.2/25.5	5.9/ 5.3
1977	83.3/79.2	9.1/ 9.1	.7/31.9	21.5/34.4	5.6/23.4	8.2/ 7.0
1978	81.6/78.8	10.9/10.9	.3/36.0	22.1/36.2	4.0/25.1	9.1/10.1
1979	86.8/83.8	11.3/11.3	.3/36.8	17.5/25.8	5.0/24.9	11.2/10.2
1980	89.1/84.2	11.9/11.9	.3/38.1	19.8/30.4	5.1/23.4	11.6/10.6

Sources: Production - Statistics Canada, Cansim.
Consumption - Statistics Canada, Candadian Per Capita Disappearance.

TABLE 33

Total Dairy Products by Butterfat Conversion

(,000,000 lbs. - whole milk equiv.*)

	1. Actual Production	2. Estimated Production	3. Estimated B.C. Consumption	4. Prod/Cons Ratio
1961	841.4	910.1	1,346.6	67.6
1971	943.9	1,046.3	1,975.3	53.0
1975	937.8	1,169.0	2,049.0	57.0
1976	925.9	1,158.3	2,037.2	56.9
1977	950.3	1,190.8	2,031.0	58.6
1978	956.0	1,196.9	2,085.0	57.4
1979	1,009.7	1,276.2	2,143.2	59.5
1980	1,044.0	1,305.2	2,200.0	59.3

Sources: 1. Statistics Canada. Total fluid milk production.
2. Sum of production on Table 34.
3. Sum of consumption on Table 34.
4. Column 2 divided by Column 3.

*Note: Derived by butterfat method, except Column 1.

TABLE 34

Dairy Products by Butterfat Conversion

(000,000 lbs. - whole milk equiv.*)

	Milk & Cream Prod/Cons	Butter Prod/Cons	Cheddar Cheese Prod/Cons	Ice Cream Prod/Cons	Other Cheese Prod/Cons	Concentrates Prod/Cons
1961	449.6	137.6/602.4	12.8/50.0	183.1/135.5	.6/22.8	126.4/86.2
1971	579.7	120.3/801.8	27.8/99.8	226.5/221.6	6.2/185.6	85.8/86.9
1975	660.9	140.6/659.9	38.3/119.0	252.2/248.7	3.4/282.3	73.6/78.2
1976	666.7	137.5/647.2	36.2/99.4	255.4/245.3	5.4/302.8	57.1/75.8
1977	679.1	131.5/584.2	36.4/89.3	269.8/256.4	7.0/318.8	66.9/103.2
1978	710.0	108.9/584.5	38.1/66.9	264.1/255.0	3.3/360.0	72.3/108.7
1979	745.0	139.2/593.2	51.3/88.0	281.1/271.2	2.6/368.5	56.9/77.3
1980	771.0	120.3/606.0	57.9/87.2	288.5/272.5	3.0/378.4	64.6/85.0

Sources: Statistics Canada, Cansim, retail weight multiplied by Agriculture Canada butterfat conversion factors except for Concentrates. Total B.C. Concentrate production in whole milk equivalent was obtained from Statistics Canada, Ottawa.

*Note: Derived by butterfat method.

NOTES ON FRUIT PRODUCTION AND CONSUMPTION

METHOD

Weight

B.C. consumption of fruits was approximated by taking Statistics Canada's Canadian per capita consumption (net of tomatoes) and multiplying it by the B.C. population. B.C. fruit consumption did not differ significantly from the rest of Canada according to the Urban Family Food Expenditure Report of food consumed at home and so the national estimates were taken to be representative of British Columbia.

Value

The dollar value of B.C. fruit consumption was obtained by multiplying the per capita expenditure on fruit, by the B.C. population. Prices and the mix of consumption varied year by year so the yearly value had to be adjusted to reflect this.

For an estimate of consumption value it was not practical to adjust the mix of 30 reported items every year according the mix reported by Statistics Canada, especially since the smaller the category, the greater the chance that the national consumption would differ from British Columbia's. Also, the earlier the reporting year, the fewer the number of items that were identified (20 items were identified in 1961 and the remainder grouped under "other fruit"). Larger, more aggregated categories were used (specifically: "fresh", "juices" and "other processed") and changed year by year according to the per capita consumption of each as reported by Statistics Canada's publication 32-226. Within these categories the mix of consumption was weighted according to consumption reported by the Urban Family Food Expenditure report for Vancouver (averaged over the last three reporting years) and is held constant over all years.

Prices for each individual item were obtained from the External Trade Report published by the Ministry of Industry and Small Business Development. From this the total volume of imports and exports was divided by their total value, and this was taken to be representative of the average wholesale prices for any given year. This price was then multiplied by the estimated consumption of each item, then totaled to give a total value of consumption.

Apples were presented separately since they represent the most important contribution to the B.C. fruit industry. B.C. production value was estimated by multiplying the net production of each item by the prices outlined above. Where these prices were unavailable, estimates from the Horticulture Branch of B.C.M.A.F. were used.

TRENDS

Per capita consumption of fruit in fresh and processed form has increased about 45% between 1961 and 1975, and has remained fairly stable in the last five years. When total consumption is broken into fresh and processed forms the most striking trend that is noticeable is that juice consumption has almost doubled in the last twenty years. This is partly due to a sharp increase of imported concentrated apple juice in recent years.

Per Capita Fruit Consumption (lbs.)

	Fresh	Juices	Other Processed	Total
1961	94.6	39.3	33.8	167.7
1971	103.4	50.6	37.8	191.8
1975	118.2	63.1	48.5	229.8
1976	132.6	64.9	51.2	248.7
1977	126.4	67.2	40.3	233.9
1978	120.7	77.5	41.7	239.9
1979	123.0	79.4	39.7	242.1
1980	123.0	81.0	40.0	244.0

Source: Statistics Canada, Canadian per capita disappearance of fruits less tomatoes which are included with vegetables. 1980 figures are estimates.

Record harvests were reported for the apple crops of 1979 and 1980. This was due to favourable weather conditions during the growing season and from younger trees coming into heavier bearing. As the apple crop constitutes about 60% of the total value of fruit production, this had a very large impact on this sector.

TABLE 35

Fruits

Distribution of Net B.C. Production by Weight

	Total	Apples	Pears	Peaches	Cherries	Grapes	Other
1961	100%	63.2	9.9	8.5	2.9	1.1	14.4
1971	100%	58.7	11.1	7.4	4.3	5.4	23.1
1975	100%	68.3	7.5	5.9	4.1	4.5	9.7
1976	100%	69.2	8.6	5.5	3.6	4.4	8.7
1977	100%	65.2	9.4	6.1	4.2	4.7	10.4
1978	100%	65.7	7.9	5.8	3.4	7.0	10.2
1979	100%	69.7	6.8	3.9	4.3	4.2	11.1
1980	100%	71.6	6.3	3.8	2.5	4.2	11.6

Sources: Commodity production less waste divided by total net production.

Distribution of Net B.C. Production by Value

	Total	Apples	Pears	Peaches	Cherries	Grapes	Other
1961	$1.00	57.5	8.7	7.2	8.9	1.0	16.7
1971	$1.00	52.1	8.8	4.9	8.2	4.0	22.0
1975	$1.00	61.1	5.9	7.0	9.3	4.1	12.6
1976	$1.00	60.3	6.9	5.7	6.9	4.8	15.4
1977	$1.00	53.1	5.3	6.2	8.0	5.6	21.8
1978	$1.00	54.7	6.1	5.7	4.9	6.5	22.1
1979	$1.00	63.3	5.0	4.0	6.0	4.1	17.6
1980	$1.00	65.6	4.8	3.9	6.4	4.6	14.7

Sources: Commodity production value divided by total net production value.

"Other" includes: Apricots, Blackberies, Blueberries, Cranberries, Loganberries, Plums, Raspberries, Strawberries.

TABLE 36

Total Fruits

(000,000 $ - wholesale)

	1 Net B.C. Production	2 B.C. Consumption	3 Net Trade
1961	26.6	32.0	- 5.4
1971	41.7	50.6	- 8.9
1975	98.4	95.9	+ 2.5
1976	94.4	96.4	- 2.0
1977	105.9	111.4	- 5.5
1978	152.9	147.2	+ 5.7
1979	136.8	170.2	- 33.4
1980	198.7	179.5 (est)	+ 19.2

Sources:
1 Estimate derived from B.C. production of fruit multiplied by prices derived from External Trade Division.
2 Estimate derived from a weighted price per pound derived from External Trade Division (total value divided by total weight).
3 The difference between Column 1 and Column 2. Assuming production and consumption estimates to be reasonably correct, a negative sign implies net B.C. imports (plus residual error) and a positive sign indicates net B.C. imports.

TABLE 37

Total Fruits

(000,000 lbs. - fresh equivalent)

	1 B.C. Production	2 Waste	3 Net B.C. Production	4 B.C. Consumption	5 Net Trade
1961	306.6	11.0	295.6	273.7	+ 21.9
1971	328.3	12.0	316.3	420.0	- 103.7
1975	543.1	19.0	524.1	560.1	- 36.0
1976	557.0	19.4	537.6	614.1	- 76.5
1977	488.3	17.1	471.2	583.9	- 112.7
1978	511.1	18.2	492.9	607.4	- 114.5
1979	484.1	16.7	467.4	623.0	- 155.6
1980	651.9	19.4	632.5	645.0(est)	- 12.5

Sources:
1. Horticulture Branch, B.C. Ministry of Agriculture And Food, Production of Tree Fruit Crops, Production of Berry Crops.
2. Percentage estimates derived from Agriculture Canada, Handbook of Food Expenditures, Prices and Consumption.
3. Column 1 - Column 2.
4. Estimates derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada and Urban Family Food Expenditure report.
5. The difference between Column 4 and Column 3. Assuming production and consumption estimates to be reasonably correct, a positive sign denotes net B.C. exports (plus residual error) and a negative sign indicates net B.C. imports.

TABLE 38

Fresh And Processed Apples

(000,000 $ - wholesale)

	1 Net B.C. Production	2 B.C. Consumption	3 Net Trade
1961	15.3	3.3	12.0
1971	21.7	8.5	13.2
1975	60.1	16.1	44.0
1976	56.9	14.4	42.5
1977	56.3	16.9	39.4
1978	83.6	21.8	61.8
1979	86.7	24.0	62.7
1980	127.3	25.6	101.7

Sources: 1 Horticulture Branch, B.C. Ministry of Agriculture and Food, Production of Tree Fruit Crops. Production is shown less waste.
2 Estimate derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada and Urban Family Food Expenditure report.
3 The sum of all Net Trade and Residuals in tables 39 and 40.

TABLE 39

Fresh Apples

(000,000 $ - wholesale)

	1 Wholesale Price (¢/lb)	2 Foreign Imports	3 Foreign Exports	4 Net Trade	5 Prov. Imports	6 Prov. Exports	7 Net Trade	8 Net B.C. Production	9 B.C. Consumption	10 Residual
1961	8.2	.6	3.7	3.1	.1	5.2	5.1	12.6	2.4	+ 1.9
1971	11.7	1.3	6.2	4.9	-	10.8	10.8	16.8	7.0	+ 5.9
1975	16.8	1.5	10.2	8.7	.1	13.6	13.5	43.8	12.8	+ 8.7
1976	15.3	1.2	10.7	9.5	-	16.3	16.3	45.8	12.3	+ 7.7
1977	18.3	2.5	13.5	11.0	-	21.7	21.7	40.8	13.5	- 5.5
1978	25.8	3.4	21.6	18.2	.1	24.7	24.6	62.2	17.5	+ 1.8
1979	26.6	4.0	21.8	17.8	.1	27.3	27.2	63.1	19.2	- 1.2
1980	28.1	N/A	24.0	N/A	N/A	N/A	N/A	94.3	20.4	+ 73.9

Sources:
1 External Trade Division. Total value of trade divided by total weight is taken to be the wholesale price.
2 Agriculture Canada Annual Unloads Report, Fruits and Vegetables, (for early years, 1 carlot = 48,000 lbs.).
3 Ministry of Industry and Small Business, External Trade Report, exports of B.C. origin.
4 The difference between Column 2 and Column 3.
5 Agriculture Canada. Annual Unloads Report, Fruits and Vegetables,
6 Ibid.
7 The difference between Column 5 and Column 6.
8 Horticulture Branch, Ministry of Agriculture and Food.
9 Estimate derived from Statistics Canada Apparent Per Capita Disappearance of Food in Canada (32-226) and the Urban Family Food Expenditure report.
10 The difference between Column 9 and Column 8 after net exports (columns 3 and 7) are subtracted from production. Assuming B.C. production and consumption estimates to be reasonably correct, a positive number implies B.C. exports not otherwise specified (plus residual error).

TABLE 40

Processed Apples

(000,000 $ - wholesale)

	1 Wholesale Price (¢/lb)	2 Foreign Imports	3 Foreign Exports	4 Net Trade	5 Net B.C. Production	6 B.C. Consumption	7 Residual
1961	8.2	.2	1.2	+ 1.0	2.7	.9	+ .8
1971	11.7	.6	2.2	+ 1.6	5.0	1.5	+ 1.9
1975	16.8	1.0	2.0	+ 1.0	16.4	3.3	+ 12.1
1976	15.3	.6	1.0	+ .4	11.2	2.1	+ 8.7
1977	18.3	.9	1.4	+ .5	15.5	3.4	+ 11.6
1978	25.8	1.0	.1	- .9	21.4	4.2	+ 18.1
1979	26.6	24.6	.1	- 24.5	23.5	4.8	+ 43.2
1980	28.1	21.0	.2	- 20.8	32.9	5.2	+ 48.5

Sources:
1. Average wholesale price of fresh apples derived by dividing the total value of trade by total weight from data reported
2. B.C. Ministry of Industry and Small Business Development, External Trade Report. Imports through B.C. ports include canned and dried product and concentrated juice. Figures for juice became available in 1979.
3. Ibid. Exports of B.C. origin include canned product and juice both concentrated and not concentrated.
4. The difference between Column 2 and Column 3. Negative signs indicate net foreign imports and positive signs denote net foreign exports.
5. Horticulture Branch, B.C. Ministry of Agriculture and Food.
6. Estimate derived from Statistics Canada, Apparent Per Capita Disappearance for Food in Canada and the Urban Family Food Expenditure report.
7. Column 6 + Column 3 - Column 5 - Column 2. Assuming B.C. production and consumption estimates to be reasonably correct, a positive sign implies net B.C. exports not specified (plus residual error) and a negative sign implies net B.C. imports not specified elsewhere.

TABLE 41

Fresh And Processed Apples

(000,000 lbs. - fresh equivalent)

	1 Net B.C. Production	2 B.C. Consumption	3 Net Trade
1961	186.8	40.8	145.9
1971	185.8	72.7	113.1
1975	358.0	95.9	262.0
1976	372.0	94.3	277.8
1977	307.4	92.4	274.8
1978	324.0	84.3	239.9
1979	325.8	90.1	244.7
1980	452.9	91.2	361.7

Sources: 1 Horticulture Branch, B.C. Ministry of Agriculture and Food (less waste).
2 Estimate derived from Statistics Canada's Canadian per capita disappearance of food figures and the Urban Family Food Expenditure report.
3 The sum of all Net Trade and Residuals in tables 42 and 43.

TABLE 42

Fresh Apples

(000,000 lbs.)

	1 Foreign Imports	2 Foreign Exports	3 Net Trade	4 Prov. Imports	5 Prov. Exports	6 Net Trade	7 B.C. Production	8 Waste	9 Net B.C. Production	10 B.C. Consumption	11 Residual
1961	6.9	45.5	38.6	1.0	63.1	62.1	158.5	4.8	153.7	29.7	+23.3
1971	11.1	53.1	42.0	-	92.2	92.2	146.6	3.4	143.2	59.9	-50.9
1975	8.7	60.8	52.1	.7	81.0	80.3	266.7	6.1	260.6	76.4	+51.8
1976	8.1	69.8	61.7	.1	106.7	106.6	306.1	7.0	299.1	80.3	+50.5
1977	13.5	73.7	60.2	-	118.5	118.5	228.1	5.2	222.9	74.0	-29.8
1978	13.2	83.7	70.5	.2	95.8	95.6	246.6	5.7	240.9	67.9	+ 6.9
1979	14.9	82.1	67.2	.3	102.5	102.2	242.8	5.6	237.2	72.1	- 4.3
1980	N/A	85.4	N/A	N/A	N/A	N/A	343.5	7.9	335.6	72.7	+262.9

Sources:
1. Agriculture Canada, Annual Unloads Report, Fruits and Vegetables. For early years, 1 carlot = 48,000 lbs.
2. External Trade Report, Ministry of Industry and Small Business. Exports of B.C. origin.
3. The difference between Column 1 and Column 2.
4. Agriculture Canada, Annual Unloads Report, Fruits and Vegetables,
5. Ibid.
6. Column 4 - Column 5.
7. Horticulture Branch, Ministry of Agriculture and Food.
8. Percentage estimate derived from Handbook of Food Expenditures, Prices and Consumption, Agriculture Canada (3.0% in 1961; 2.3% in all other years).
9. Column 7 - Column 8.
10. Estimate derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada and Urban Family Food Expenditure report.
11. The difference between Column 10 and Column 9 after net exports (columns 3 and 6) are subtracted from production. Assuming B.C. production and consumption estimates to reasonably correct, a positive sign implies net B.C. exports not otherwise specified, and a negative sign implies net B.C. imports.

TABLE 43

Processed Apples

(000,000 lbs. - fresh equivalent)

	1 Foreign Imports	2 Foreign Exports	3 Net Trade	4 B.C. Production	5 Waste	6 Net B.C. Production	7 B.C. Consumption	8 Residual
1961	2.3	15.0	+ 12.7	34.0	1.0	33.0	11.1	+ 9.1
1971	5.2	19.1	+ 13.9	43.6	1.0	42.6	12.9	+ 15.8
1975	5.9	11.8	+ 5.9	99.8	2.3	97.5	19.5	+ 72.1
1976	4.1	6.5	+ 2.5	74.7	1.7	73.0	14.0	+ 56.5
1977	4.9	7.7	+ 2.8	86.5	2.0	84.5	18.4	+ 63.4
1978	3.7	.2	- 3.3	85.0	2.0	83.0	16.4	+ 70.1
1979	92.5	.3	- 92.2	90.6	2.1	88.5	18.0	+162.7
1980	74.6	.6	- 74.0	120.0	2.8	117.2	18.5	+172.7

Sources:
1. External Trade Division, Ministry of Industry and Small Business. Imports through B.C. ports include canned and dried product and concentrated juice. Figures for juice became available in 1979 although it apears there has been a sharp influx of this product in the last 4 or 5 years.
2. Ibid. Exports of B.C. origin include canned product and juice both concentrated and not concentrated.
3. The difference between Column 1 and Column 2. A positive sign denotes net exports and a negative sign net imports.
4. Horticulture Branch, B.C. Ministry of Agriculture and Food.
5. Percentage estimate derived from Agriculture Canada Handbook of Food Expenditures, Prices and Consumption, (3.0% in 1961; 2.3% in all other years).
6. Column 4 - Column 5.
7. Estimate derived from Statistics Canada Apparent Per Capita Disappearance of Food in Canada and the Urban Family Food Expenditure report.
8. Column 6 + Column 3 - Column 7. Assuming B.C. production and consumption estimates to be reasonably correct, a positive sign implies net B.C exports not specified (plus residual error), and a negative sign implies net B.C. imports not specified elsewhere.

NOTES ON VEGETABLE PRODUCTION AND CONSUMPTION

METHOD

Weight

B.C. consumption of all vegetables (including tomatoes and potatoes) was approximated by taking Statistics Canada's Canadian per capita consumption figures and multiplying them by the B.C. population. This estimate could not be compared with the Urban Family Food Expenditure Report because the latter reported consumption of many items by number rather than by weight. Production estimates were from the Horticulture Branch of the B.C.M.A.F. In addition a "waste rate" for each item was estimated from Agriculture Canada's "Handbook of Expenditures, Prices and Consumption", applied to the production of each item and then summed to give a total waste estimate. This was deducted to yield a figure for net production.

Value

As with the fruit sector, the total dollar value of B.C. fruit consumption was derived by multiplying a per capita expenditure on vegetables by the B.C. population.

Consumption was broken down first into fresh and processed vegetables and further broken down into individual items as reported in Statistics Canada publication 32-226.

For an estimate of consumption value it was not practical to adjust the mix of 40 reported items every year according the mix reported by Statistics Canada, since the smaller the category, the greater the chance that the national consumption would differ from British Columbia's. Also, the earlier the reporting year, the fewer the number of items that were identified (17 items were identified in 1961 and the remainder grouped under "other vegetables"). Larger more aggregated categories were used (specifically: "fresh" and "other processed") and changed year by year according to the

per capita consumption of each as reported by Statistics Canada's publication 32-226. Within these categories the mix of consumption was weighted according to consumption reported by the Urban Family Food Expenditure report for Vancouver (averaged over the last three reporting years) and is held constant over all years.

B.C. production value was estimated by multiplying net production of each item by prices derived in the manner explained above.

TRENDS

The only noticeable trend has been a steady increase in the production of mushrooms to the point where it has become quite significant in the total value of B.C. vegetable production.

B.C. Mushroom Production

	,000 lbs.[1]	Price/lb.[2]	,000 $[3]
1961	1,852	$ .50	926
1971	4,265	$ .63	2,687
1975	7,527	$ .55	4,140
1976	8,546	$ .69	5,897
1977	11,174	$ .69	7,710
1978	13,401	$ .71	9,515
1979	14,462	$ .75	10,847
1980	17,550	$ .80	14,040

Sources:

1 Horticulture Branch, B.C.M.A.F.
2 Estimates wholesale price derived from Ministry of Industry and Small Business Development publication External Trade Report. Total volume of mushroom imports and exports is divided by the total price to yield an average annual price per pound.
3 Column 1 multiplied by Column 2.

TABLE 44

Vegetables

Distribution of Net B.C. Production by Weight

	Total	Potatoes	Corn	Carrots	Peas	Cabbage	Other
1961	100%	46.2	9.1	3.7	9.0	2.4	29.6
1971	100%	45.6	11.9	3.4	4.9	3.2	31.0
1975	100%	47.7	10.7	2.9	5.3	4.9	28.5
1976	100%	56.9	9.7	3.2	3.8	3.1	23.3
1977	100%	49.5	7.7	3.9	5.7	3.4	29.8
1978	100%	40.5	11.4	4.9	4.5	3.6	35.1
1979	100%	45.1	8.5	5.1	3.9	4.0	33.4
1980	100%	41.1	8.4	5.4	4.8	5.0	35.3

Sources: Commodity production less waste divided by total net production.

Distribution of Net B.C. Production by Value

Total	Potatoes	Mushrooms	Peas	Corn	Onions	Other
$1.00	25.0	6.0	18.0	9.3	2.3	39.4
$1.00	21.9	12.5	12.9	13.1	3.9	35.7
$1.00	31.7	12.0	22.5	10.3	5.5	18.0
$1.00	25.2	14.1	17.5	7.8	2.5	32.9
$1.00	25.2	14.2	20.5	5.5	3.8	30.8
$1.00	18.2	16.4	19.2	7.6	3.1	35.5
$1.00	19.3	17.0	13.5	7.3	4.1	38.8
$1.00	26.5	23.7	13.8	6.9	8.1	21.0

Sources: Commodity production value divided by total net production value.

TABLE 45

Total Vegetables

(000,000 $ - Wholesale)

	1 Net B.C. Production	2 B.C. Consumption	3 Net Trade
1961	15.5	24.9	+ 9.4
1971	21.4	45.3	+ 23.9
1975	34.4	83.2	+ 48.8
1976	41.8	73.1	+ 31.3
1977	54.3	96.9	+ 42.6
1978	57.9	103.9	+ 46.0
1979	63.9	114.5	+ 50.6
1980	59.1	122.4	+ 63.2

Sources: 1 Estimate derived from B.C. production of vegetables multiplied by prices derived from External Trade Division.
2 Estimate derived from a weighted price per pound derived from External Trade Division (total value divided by total weight).
3 Column 1 - Column 2. Assuming production and consumption estimates to be reasonably correct, a negative sign implies net B.C. exports and a positive number indicates net B.C. imports

TABLE 46

Total Vegetables

(000,000 lbs. - fresh equivalent)

	1 B.C. Production	2 Waste	3 Net B.C. Production	4 B.C. Consumption	5 Net Trade
1961	302.8	27.1	275.6	550.0	+ 274.3
1971	325.1	25.7	299.3	691.0	+ 391.7
1975	389.2	29.9	339.3	847.0	+ 507.7
1976	415.1	37.4	377.8	797.8	+ 420.0
1977	412.5	33.7	378.8	808.4	+ 429.6
1978	361.8	26.6	335.2	838.0	+ 502.7
1979	446.8	33.6	413.2	920.6	+ 507.4
1980	379.8	28.5	351.3	951.3	+ 599.9

Sources:
1 Horticulture Branch, B.C. Ministry of Agriculture and Food.
2 Percentage estimates derived from Handbook of Food Expenditures, Prices and Consumption, Agriculture Canada.
3 Column 1 - Column 2.
4 Estimates derived from Statistics Canada Canadian per capita disappearnce figures and the Urban Family Food Expenditure report.
5 Column 4 - Column 3. Assuming production and consumption estimates to be reasonably correct, a negative sign implies net B.C. exports and a positive number indicates net B.C. imports.

NOTES ON FISH PRODUCTION AND CONSUMPTION

METHOD

The production of all seafood by weight and wholesale value was obtained from the Canada Department of Fisheries and Oceans. Since B.C. is obviously the only western producer of seafood, the weight and value of B.C. exports to other countries was taken from the External Trade Division reports. Consumption was estimated from StatisticB Canada Canadian per capita estimates multiplied by the provincial population although the Urban Family Food Expenditure Report suggests that B.C. consumption is 40 - 50% higher than the national average.

TRENDS

Relative to other food products fish has the greatest value and, of late, demonstrates the greatest instability in prices and volume of production. Including fish in total food production therefore produces large fluctuations in that of the trend of the total.

The 1981 prices and catch of the industry's two most important fish, salmon and herring, are reportedly as poor as 1980's. Salmon is currently at a low point in its stock cycle and this was compounded by some degree of over fishing. In addition local union fishermen have met increased price competion with the emergence of the Brystal Bay salmon fishery in Alaska, which has now taken a larger share of the total market.

Herring stocks are also at a low point and the 1980 catch was also affected by the fishermen's strike. Prices were bid up to record rates in 1979 by the Japanese but there was adverse consumer reaction to this in 1980 and prices collapsed.

In sum, the total catch is down because of low fish stocks but the major impact on the industry has been recent market developements.

TABLE 47

Fish

(000,000 $ - wholesale)

	1 Price Per lb.	2 Foreign Exports	3 B.C. Production	4 B.C. Consumption	5 Other Net Exports
1961	.12	5.1	77.9	2.4	70.4
1971	.53	40.6	120.1	13.8	65.7
1975	.56	47.9	167.0	17.5	101.7
1976	.77	87.2	297.6	30.6	179.8
1977	.85	134.0	371.8	36.0	201.7
1978	1.21	187.8	517.5	50.0	279.7
1979	1.75	202.7	565.6	73.0	290.0
1980	.85	87.2	257.0	37.1	132.8

Sources:
1 Information provided by Peter Light, Federal Department of Fisheries & Oceans, Vancouver.
2 Ministry of Industry & Small Business Development, External Trade Report.
3 Federal Department of Fisheries & Oceans.
4 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada.
5 Column 3 - Column 2 - Column 4. This column consists mainly of B.C. shipments to other provinces less a small volume of foreign and maritime imports.

TABLE 48

Fish

(000,000 lbs.)

	1 Foreign Exports	2 B.C. Production	3 B.C. Consumption	4 Other Net Exports
1961	42.4	636.1	20.2	573.4
1971	76.6	227.3	26.0	124.7
1975	85.5	297.9	31.2	181.2
1976	113.3	384.7	39.7	231.7
1977	157.7	437.4	42.4	237.3
1978	155.2	426.1	41.3	229.5
1979	115.8	322.3	41.7	164.8
1980	102.5	301.8	43.6	155.6

Sources:
1 External Trade Report.
2 Federal Department of Fisheries & Oceans, Vancouver.
3 Derived from Statistics Canada, Apparent Per Capita Disappearance of Food in Canada.
4 Column 2 - Column 1 - Column 3. The main component of this residual is B.C. shipments to other Provinces less a small volume of foreign and maritime imports.

NOTES ON GRAIN PRODUCTION AND CONSUMPTION

METHOD

In B.C., the grains produced are Number 3 grade or lower and these are used almost exclusively for animal feeds, while the Numbers 1 and 2 grade grains used for human consumption are imported from out of the province. Although some Number 3 grade wheat produced in B.C. is exported to China for human consumption it is not considered part of Canada's market for human use and so is not treated as such. In other words, all B.C. grain production is assumed to be devoted to the animal feed market. Therefore, the difference between production plus feed imports and feed consumption is taken to be the net trade of B.C. grain.

"Animal feed units" are the estimated grain requirements per animal per year. For example a milk cow consumes 1.134 tonnes of grain per year while a turkey consumes .0363 tonnes. These feed units are multiplied by the numbers of animals in each livestock class and the results summed, to arrive at a total feed requirement for any given year. The weak assumption in this estimate of grain demand is that "animal feed units" will reflect the demand for feed grain, when, in fact, the amount of grain fed to each livestock class will depend on the price of grain relative to substitute feeds such as forage. A more accurate total picture of the feed grain demand within B.C. might be gained by researching the volumes of B.C. grains purchased by the Wheat Board for export, and then netting out such exports from production to arrive at an estimate of consumption.

Column 8 in Tables 49 and 50 indicates the net trade in feed grains. The percentage of B.C.'s annual feed grain production that in fact enters trade is substantially larger than shown (over 80% of B.C.'s grain output is exported), but since there is also annually a large inflow of grain from Alberta for feed use, these outflows and inflows to the extent that they cancel each other are ignored for purposes of computing the production/consumption ratio. The excess of grain inflows over exports which comprises both grain for human use and feed grain required in excess of B.C.'s production, is shown in Column 9. These estimates of net import are entered on the consumption side for purposes computing the overall value ratio (Table 1).

Grain prices were obtained from Wheat Board prices to producers and the Winnipeg Commodity Exchange. However, such prices are farm gate prices and since the prices for valuing commodities in this study are prices at the wholesale level, grain values may be somewhat understated.

TABLE 49

Total Grains

(000,000 $)

	B.C. Net Production			B.C. Consumption				
	1 Imported Feed	2 B.C. Production	3 Seed	4 Net B.C. Production	5 B.C. Feed Consumption	6 B.C. Human Consumption	7 Total Consumption	8 Net Trade Feed Grain	9 Net Trade All Grain
1961	8.8	9.1	.5	8.6	18.8	8.5	27.3	- 10.2	- 18.7
1971	17.7	12.9	.7	12.2	21.2	12.3	33.5	- 8.8	- 21.3
1975	34.8	26.3	1.5	24.7	57.1	42.9	99.9	- 32.4	- 75.2
1976	31.5	23.4	1.4	22.0	43.6	39.5	83.2	- 21.6	- 61.2
1977	27.4	23.1	1.3	21.8	47.9	28.5	76.4	- 26.1	- 54.6
1978	31.7	19.2	1.3	17.9	48.7	33.0	81.7	- 30.8	- 63.8
1979	47.4	29.96	1.6	28.3	60.4	39.7	100.1	- 32.1	- 71.8
1980	66.10	71.8	3.8	68.0	86.9	47.6	134.5	- 18.9	- 66.5

Sources:
1. Feed imported to B.C. from Alberta by the Feed Freight Assistance Program, plus additional imports of screenings; price information from Canadian Livestock Feed Board.
2. Statistics Canada. Total of all grains not including rapeseed.
3. Derived from Statistics Canada, Cansim, seeded acreage multiplied by the seed requirements per acre for each grain.
4. Column 2 - Column 3.
5. Derived from Statistics Canada, B.C. "animal feed units".
6. Derived from Statistics Canada, Canadian per capita disappearance of food figures multiplied by the price paid for No. 1 C.W. Red Spring 13.5% wheat by the Canadian Wheat Board. Other grain prices are from Winnipeg Commodity Exchange.
7. Column 5 + Column 6.
8. The difference between Column 5 and Column 4. The negative sign indicates net imports. The derivation of this column assumes that all B.C. production is used as feed.
9. The difference between Column 7 and Column 4.

TABLE 50

Total Grains

(000,000 lbs.)

		B.C. Net Production			B.C. Consumption				
	1 Imported Feed	2 B.C. Production	3 Seed	4 Net B.C. Production	5 B.C. Feed Consumption	6 B.C. Human Consumption	7 Total Consumption	8 Net Trade Feed Grain	9 Net Trade All Grain
1961	666.0	433.8	23.0	410.8	1,160.7	329.9	1,490.6	- 749.9	-1,079.8
1971	966.4	755.8	37.2	718.7	1,191.6	439.6	1,631.2	- 472.9	- 912.5
1975	843.0	549.1	29.2	519.9	1,307.3	536.2	1,843.5	- 787.4	-1,323.6
1976	810.0	755.6	33.8	721.8	1,124.4	556.9	1,681.2	- 402.6	- 959.4
1977	527.2	675.6	30.8	644.8	1,142.0	587.4	1,729.4	- 497.2	-1,084.6
1978	770.4	478.3	27.6	450.7	1,199.3	620.3	1,819.6	- 748.6	-1,368.9
1979	1,001.2	599.1	25.6	573.5	1,256.6	650.5	1,907.2	- 683.1	-1,333.7
1980	1,082.5	1,019.6	39.2	980.4	1,336.0	634.5(est)	1,970.5	- 355.6	- 990.1

Sources:
1. Feed imported to B.C. from Alberta by the Feed Freight Assistance Program, plus additional imports of screenings.
2. Statistics Canada. Total of all grains, not including rapeseed.
3. Statistics Canada. Derived from seeded acreage multiplied by the seed requirements per acre for each grain.
4. Column 2 - Column 3.
5. Derived from Statistics Canada, B.C. "animal feed units".
6. Derived from Statistics Canada, Canadian per capita disappearance figures.
7. Column 5 + Column 6.
8. The difference between Column 5 and Column 4. The negative sign indicates net imports. The derivation of this column assumes all B.C. production is used as feed.
9. The difference between Column 7 and Column 4.

NOTES ON MISCELLANEOUS PRODUCTION AND CONSUMPTION

METHOD

Consumption of all miscellaneous items was computed based on Statistics Canada national per capita consumption estimates and B.C. population. Wholesale prices for all items were approximated using data in the External Trade Report. Since B.C. does no processing, rapeseed production by weight was expressed in oil form (ie: the processed form) while the value was based on producer receipts. Honey prices indicated in the External Trade Report were less than B.C. cash receipts so the latter was used for production values.

B.C. does not grow sugarcane but imports and refines it. For this reason there is no sugar production by weight indicated in the tables, but a production value is given to approximate the value added that B.C. imparts to sugar in processing. Values for refined sugar are not published, so upon review of the price of sugarcane indicated by the External Trade Report and the retail price of refined sugar, it is assumed that B.C. imparts an additional 50% to the value of sugar (at the wholesale level). Although this is probably a conservative estimate it provides a rough notion of the relative size of that particular commodity sectors.

TABLE 51

Miscellaneous

(000,000 $ - wholesale)

		B.C. Production				
	1 Net Imports	2 Rapeseed	3 Honey	4 Sugar	5 Total	6 Consumption
1961	26.7	.1	.4	6.4	6.9	33.6
1971	46.3	1.1	.9	11.1	13.1	59.3
1975	83.5	5.6	2.1	26.7	34.4	118.0
1976	98.7	2.9	1.6	24.0	28.5	127.2
1977	126.7	10.5	3.3	32.5	46.3	173.0
1978	121.1	17.0	2.8	24.5	44.2	165.3
1979	107.7	33.2	3.9	23.0	60.0	167.3
1980	148.0	15.9	3.6	36.6	56.1	204.1

Sources:
1 Column 6 - Column 5.
2 Statistics Canada, Cansim (Farm Cash Receipts).
3 Statistics Canada, Cansim (Farm Cash Receipts).
4 External Trade Division refined prices divided by 2 - it is assumed that B.C. refineries impart an additional 50% to the value of sugar.
5 Column 2 + Column 3 + Column 4
6 Total of detailed tables.

TABLE 52

Miscellaneous Consumption

(000,000 $ - wholesale)

	Coffee	Tea	Cocoa	Rice	Oils	Total
1961	6.0	2.0	.8	.4	7.5	16.7
1971	9.8	2.3	3.1	.7	13.5	29.4
1975	17.0	3.9	4.8	2.5	23.2	51.4
1976	29.5	4.1	4.6	2.1	27.1	67.4
1977	45.5	8.7	8.6	2.2	29.8	94.8
1978	50.0	6.8	12.6	2.7	29.6	101.7
1979	46.8	7.0	12.6	4.1	28.7	99.2
1980	58.1	8.4	11.9	4.5	33.2	116.1

Sources: Prices derived from External Trade Report and applied to consumption weight.

Weight derived from Statistics Canada Canadian per capita disappearance figures.

TABLE 53

Miscellaneous Consumption

(000,000 $ - Wholesale)

	Honey	Sugar	Other Sugars	Total
1961	.6	12.8	.8	14.1
1971	.8	22.1	1.7	24.6
1975	2.8	53.5	.4	56.7
1976	2.7	48.1	.4	51.2
1977	2.9	64.9	.4	68.2
1978	3.5	49.0	.5	53.0
1979	4.5	45.9	.5	51.0
1980	4.3	73.3	.7	78.3

Sources: Prices derived from External Trade Report and applied to consumption weight.
Statistics Canada, Canadian Per Capita Disappearance figures.

TABLE 54

Miscellaneous Consumption

(000,000 $ - wholesale)

	Dry Beans	Dry Peas	Peanuts	Tree Nuts	Total
1961	1.5	.3	.6	.4	2.8
1971	1.6	.7	1.5	1.5	5.3
1975	2.4	1.3	3.9	2.4	10.0
1976	.9	.6	4.1	3.0	8.5
1977	1.1	.5	4.4	4.0	10.0
1978	1.2	.9	4.1	4.5	10.7
1979	1.7	1.6	5.7	8.1	17.1
1980	.2	1.0	4.4	8.1	13.6

Sources: Prices derived from External Trade Report and applied to consumption weight.

Weight derived from Statistics Canada Canadian per capita disappearance figures.

TABLE 55

Miscellaneous

(000,000 lbs.)

	1 Net Imports	B.C. Production			5 Consumption
		2 Rapeseed	3 Honey	4 Total	
1961	265.2	1.0	2.1	3.1	268.3
1971	370.6	9.1	3.7	16.0	386.6
1975	380.2	19.9	3.6	23.5	403.7
1976	399.3	9.1	2.7	11.7	411.0
1977	371.6	30.8	5.5	36.3	407.9
1978	370.6	48.9	4.2	53.0	423.6
1979	318.8	97.7	5.2	102.9	421.7
1980	366.5	45.3	3.9	49.1	415.6

Sources:
1 Column 5 - Column 4.
2 Statistics Canada, converted to oil form by multiplying B.C. production (in bushels) by the weight per bushel (50 lbs.) then by the oil extraction rate (36.2%).
3 Statistics Canada.
4 Column 2 + Column 3.
5 Total of detailed tables.

TABLE 56

Miscellaneous Consumption

(000,000 lbs.)

	Coffee	Tea	Cocoa	Rice	Oils	Total
1961	14.7	3.9	2.8	5.7	49.9	77.0
1971	19.6	5.3	7.7	14.9	66.0	113.5
1975	23.3	5.9	7.1	13.3	89.9	139.5
1976	24.0	6.2	7.7	14.4	94.6	146.9
1977	19.1	6.4	7.1	14.6	97.0	144.2
1978	23.6	5.7	7.6	15.9	98.6	151.4
1979	25.6	5.6	7.0	17.9	97.1	153.2
1980	29.3	6.0	8.4	18.7	93.6	156.0

Sources: Derived from Statistics Canada Canadian per capita disappearance figures.

TABLE 57

Miscellaneous Consumption

(000,000 lbs.)

	Honey	Sugar	Other Sugars	Total
1961	2.8	159.4	15.2	177.4
1971	3.4	221.3	23.9	248.5
1975	4.7	213.9	5.2	223.7
1976	4.6	228.9	3.9	237.4
1977	4.9	231.9	3.2	240.1
1978	5.2	233.2	3.3	241.6
1979	6.0	229.7	3.3	238.9
1980	4.5	229.0	2.9	236.4

Sources: Derived from Statistics Canada Canadian per capita disappearance figures.

TABLE 58

Miscellaneous Consumption

(000,000 lbs.)

	Dry Beans	Dry Peas	Peanuts	Tree Nuts	Total
1961	4.6	2.1	5.2	2.0	13.9
1971	6.2	3.7	11.4	3.3	24.6
1975	8.5	6.0	21.5	4.4	40.4
1976	3.2	3.5	14.5	5.4	26.7
1977	3.7	1.8	12.9	5.1	23.6
1978	3.8	6.1	15.7	5.1	30.7
1979	4.8	3.7	15.0	6.3	29.6
1980	.6	2.5	13.1	7.0	23.2

Sources: Derived from Statistics Canada Canadian per capita disappearance figures.

FLORICULTURE AND NURSERY

Very little information is available on this particular agricultural sector, though it soon may rival vegetable production in total wholesale value. Farm cash receipts have quadrupled in the seven years since Statistics Canada first started reporting this agricultural sector. Farm cash receipts are taken to be the "wholesale" value since there is no processing involved and the product is sold directly to retailers or the retail market. No "consumption" information is available so a residual estimate for net trade cannot be derived. However, the volume of traffic through B.C. ports is provided on the following page to give an indication of the size of foreign markets.

In a publication produced by the B.C. Nursery Trades Association the geographical distribution of sales was estimated and is shown here:

Distribution of B.C. Floriculture
And Nursery Production

B.C.	63%
Prairies	17%
Quebec	12%
Ontario	7%
U.S.	1%

Source: "Dig This", B.C. Nursery Trades Association news magazine, March/April 1980, Vol. 5, No. 2

TABLE 59

Floriculture And Nursery

(,000,000 $ - wholesale)

	1 Imports	2 Exports	3 B.C. Production
1973	3.3	.9	9.5
1974	4.7	.9	12.3
1975	7.2	.7	18.6
1976	8.1	.8	23.6
1977	9.8	1.1	26.6
1978	11.8	1.3	30.7
1979	12.8	1.8	37.7
1980	13.5	1.3	40.7

Sources: 1 External Trade Report, Ministry of Industry and Small Business, trade through B.C. custom ports.
2 External Trade Report, Ministry of Industry and Small Business, trade through B.C. custom ports
3 Statistics Canada, Cansim, Farm Cash Receipts.

TABLE 60

Alcoholic Beverages

(,000,000 $ - wholesale)

	Beer Prod/Cons	Wine Prod/Cons	Spirits Prod/Cons	Total Prod/Cons
1971	37.1/N/A	14.7/N/A	N/A/N/A	N/A/161.5
1975	61.5/N/A	21.3/N/A	55.5/N/A	138.3/258.8
1976	67.2/N/A	24.9/N/A	33.2/N/A	125.3/268.7
1977	79.9/N/A	26.0/N/A	39.7/N/A	145.6/276.1
1978	73.1/N/A	33.3/N/A	41.7/N/A	148.1/277.0
1979	110.0/N/A	35.0/N/A	46.0/N/A	191.0/311.9
1980	113.0/N/A	50.0/N/A	55.0/N/A	218.0/N/A

Sources: Production - Statistics Canada, Census of Manufacturers value of shipments, contact Central Statistics Bureau; the last two years are estimates from the Central Statistics Bureau.

TABLE 61

Alcoholic Beverages

(,000,000 - gallons)

	Beer Prod/Cons	Wine Prod/Cons	Spirits Prod/Cons
1961	N/A/20.8	N/A/ .9	N/A/1.9
1971	39.1/38.7	4.4/3.6	6.1/4.1
1975	42.7/44.8	10.3/4.5	12.1/5.9
1976	45.8/43.6	9.4/4.1	7.0/5.6
1977	47.0/49.0	9.7/4.8	12.9/5.9
1978	41.6/40.9	12.2/6.5	9.3/6.5
1979	47.3/49.9	12.6/6.9	18.7/6.1
1980	N/A/N/A	N/A/N/A	N/A/N/A

Sources: Production - Statistics Canada, Census of Manufacturers value of shipments, contact Central Statistics Bureau.
Consumption - Statistics Canada, 63-202.

APPENDIX

At the retail level the bulk of food consumed within the province is consumed at home, but studies such as Statistics Canada's Urban Family Food Expenditure Report indicate that an increasing proportion of total food expenditure is spent on food away from home.

B.C. Retail Food Expenditures

(,000,000 $)

	Consumed At Home	Consumed by H.R.I.*	TOTAL	H.R.I. As % Of Home
1961			520	
1962	430	100	530	23.3
1969	740	170	910	23.0
1970			1,030	
1971			1,160	
1972			1,250	
1973			1,430	
1974	1,300	400	1,700	30.8
1975			1,870	
1976	1,500	450	1,950	30.0
1977			2,070	
1978	1,850	600	2,450	32.4
1979			2,740	
1980			3,020	

* Hotels, Restaurants and Institutions.

Source: Statistics Canada, Urban Family Food Expenditure Report, Vancouver food expenditures. Data from the Survey is shown for the years 1962, 1969, 1974, 1976 and 1978. Total expenditure for the other years is estimated applying the change in the food consumer price index for Vancouver to the Survey expenditure data.

The table below outlines the proportion of the retail food dollar spent in individual commodity sectors.

	Red Meats	Poultry & Eggs	Dairy Products	Vegetables	Fruits	Fish	Grains	Other	Total
1969	.237	.073	.149	.077	.074	.024	.113	.189	$1.00
1974	.285	.078	.141	.087	.079	.030	.115	.181	$1.00
1976	.237	.071	.175	.092	.088	.034	.120	.191	$1.00
1978	.230	.071	.163	.093	.109	.043	.113	.177	$1.00

Source: Statistics Canada Urban Family Food Expenditure Report, Vancouver food expenditures. Expenditure on each item consumed at home is divided by total food expenditure to obtain the proportions. Since the Food Expenditure Survey does not define commodities for away from home consumption it is assumed that the consumption pattern of food eaten away from home is the same as that of food eaten at home. It is further assumed that the Vancouver data reflects the eating patterns of the whole population of B.C.

Note: Totals do not add due to rounding.

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